# AMERICAN ARTISAN

WARM AIR HEATING • SHEET METAL
CONTRACTING • AIR CONDITIONING

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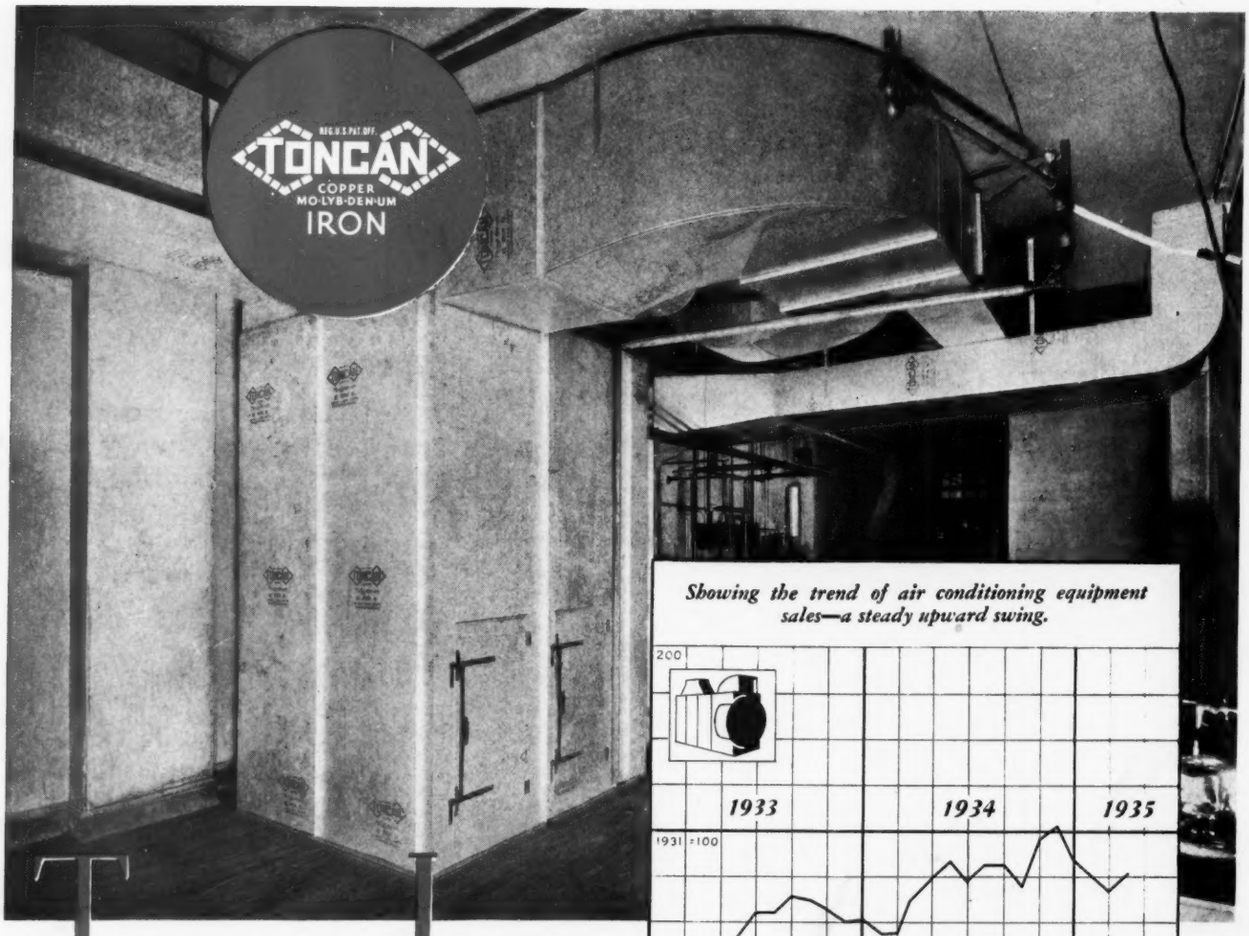
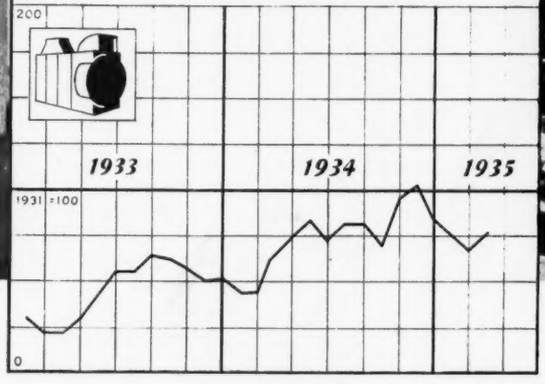
UGUST
1935

THE AIR CONDITIONING SECTION




*Showing the trend of air conditioning equipment sales—a steady upward swing.*




# Toncan Iron

## HELPS THE SHEET METAL CONTRACTOR GET AIR CONDITIONING BUSINESS

A well known heating and ventilating company* of Cleveland, Ohio, recently designed and installed an air conditioning system in one of the popular restaurants of that city. The duct system was fabricated by a local sheet metal contractor. All the sheet metal was Toncan Copper Molybdenum Iron.

Sheet metal contractors should lose no time in contacting companies engaged in air conditioning work. This business has already consumed thousands of tons of fabricated sheet metal and will prove a source of steady profit in the future. One way to make this profit more certain is to see that Toncan Iron is used. It lasts longer because it is a corrosion-resisting alloy. It fabricates easily because it is ductile, and therefore it costs less to work up into ducts. It's a good-will builder—a 24-hour-per-day salesman that sells for you without being on the payroll.

Hundreds of suggestions for logical uses of this long-lasting modern alloy are given in "The Path to Permanence," which we will gladly send upon request.

REPUBLIC STEEL

Republic Steel
CORPORATION
GENERAL OFFICES · · · YOUNGSTOWN, OHIO

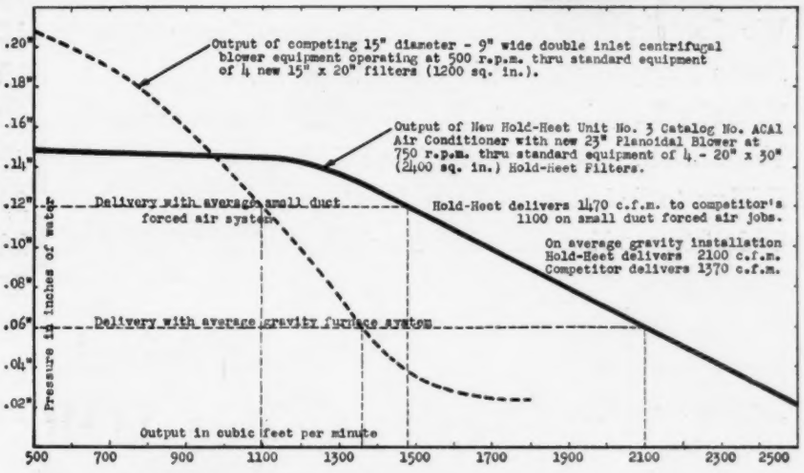
* *Name furnished on request.*

# You too would adopt Planoidal Blowers if you knew the facts

**53%** *More Air On Gravity Systems*

**33%** *More Air On Small Duct Systems*

***Noiseless Operation***


Output of competing 15" diameter - 9" wide double inlet centrifugal blower equipment operating at 500 r.p.m. thru standard equipment of 4 new 15" x 20" filters (1200 sq. in.).
Output of New Hold-Heet Unit No. 3 Catalog No. ACA1 Air Conditioner with new 23" Planoidal Blower at 750 r.p.m. thru standard equipment of 4 - 20" x 30" (2400 sq. in.) Hold-Heet Filters.
Delivery with average small duct forced air system
Hold-Heet delivers 1470 c.f.m. to competitor's 1100 on small duct forced air jobs.
On average gravity installation Hold-Heet delivers 2100 c.f.m. Competitor delivers 1370 c.f.m.
Delivery with average gravity furnace system
Pressure in inches of water
.20" .18" .16" .14" .12" .10" .08" .06" .04" .02"
Output in cubic feet per minute
500 700 900 1100 1300 1500 1700 1900 2100 2300 2500

## Study the performance curves . . . .

The competing centrifugal blower had to operate at the excessive tip speed of 2000 feet per minute to make the poor showing illustrated by the dotted line (when quietness is a factor, 1700 feet per minute tip speed is about the limit for a centrifugal blower).

Both curves show the useful work the competing units will do in YOUR part of the system (through ducts and furnace). All losses through the filter, blower, and cabinet are already deducted.

NO WONDER leading furnace manufacturers and distributors are pushing the Hold-Heet No. 3 Unit.

NO WONDER dealers repeat and repeat and repeat as soon as they have sample installations they can demonstrate.

***Centrifugal Furnace Blowers are as out of date as the Horse and Buggy.***

# OUTCLASSES all others *in every detail*

**1. 100 Speed Control.** Simply turn the control handle to increase delivery in cold weather or to "tune out" duct vibrations.

**2. Noiseless Blower.** Not a disk fan not a centrifugal blower, but a Planoidal Blower fully protected by U. S. Patent No. 1,998,184. Absolutely noiseless in operation because two blades turning at a maximum speed of 750 r.p.m. give a heat frequency considerably below 30 per second, which is the minimum audible range of the human ear.

**3. Ballentine Capacitor Motor.** A ¼ h. p., 8-pole, variable speed, capacitor motor such as Hold-Heet employs would cost competing manufacturers approximately four times what they actually pay for the cheap types of split phase motors that are used. The customer pays the difference in high operating expense, noisy starting, and the dimmed light resulting from the 20 to 25 ampere starting current as compared to the Hold-Heet starting current of 4 amperes.

**4. 48% Static Pressure Efficiency.** This remarkable efficiency may be best appreciated when one learns that the new blower recently heralded with much acclaim by one of the largest manufacturing and research organizations in the air conditioning field has a maximum static pressure efficiency of 15% in the useful operating range—requiring three times as much power as Hold-Heet to give less output.

**5. Oversize Filter Area—** Hold-Heet supplies 2400 sq. in. Compare this with the competitor who claims the 1200 sq. in. employed in his unit is 50% greater than is usually found on units of comparable size. Filter resistance varies with the square of the velocity. 2000 c.f.m. through 1200 square inches would have a pressure drop of .08". This same volume through the 2400 square inches Hold-Heet employs would have a pressure drop of only .02".

**6. Free Gravity Circulation.** It is vitally necessary that all furnaces employing solid fuel should have free gravity circulation or the heating plant may be ruined through overheating when the blower is not running. Hold-Heet insures free gravity circulation by oversize filter area, direct air passage, large port area, combined with a type of blower blade that does not obstruct the free passage of air.

**7. Low Installation Cost.** No subbase is required, no expensive hood, no canvas connections. Hold-Heet saves on initial cost, on installation cost and on operating cost.

**8. One Standardized Unit.** takes care of the 10-room house or the small bungalow. Simply adjust the 100 speed control to the output the job requires. Only one unit to stock—only one unit to sell—concentrate on Hold-Heet.

## Your Best Investment

The one that will make you the most money in the months to come is one of these No. 3 Units to demonstrate on your display floor. The quality and appearance is so striking, the performance features are so outstanding, the demonstration you can make is so compelling that countless prospects would buy now if they could see the unit in operation. Order your demonstrator now.

## Hold-Heet Unit No. 3

Catalog No. ACA1 is supplied complete—assembled in 28" x 30" x 51" heavy rigid steel cabinet with attractive gray enamel finish, ⅛ h.p. Ballentine Capacitor Motor with direct-connected 23" Planoidal Blower, four 20" x 30" Hold-Heet Filters, Hold-Heet rod and tube-type Fan-Switch, Control Box with 100-speed control—All for Dealer price, f. o. b. Chicago ..... **$50.50**

**RUSSELL ELECTRIC CO., Mfrs.,** 342 W. HURON STREET CHICAGO

## IN THIS ISSUE

We intended to publish in this issue a copy of the Dayton, Ohio, installation ordinance, but we are advised that some changes are imminent so we withhold publication until next month. Anyone wanting information can write us.

*

Better weather protection is becoming more and more important—both for new and old buildings. This issue carries the first of a series showing recommended protection practices. See page 16.

*

Two issues ago we suggested that a fertile field for business is among your old customers. Many letters were received, among them a report so interesting that we publish a story on the activity on page 18. There may be ideas here you can use.

*

Oftentimes the problem arises in collecting work—what velocity? On page 20 is some up-to-date information on velocities required for different materials.

*

The Ohio Sheet Metal and Roofing Contractors just closed an unusual convention at which practically everything new was displayed. Also an unusual paper on air conditioning. See page 24.

*

What is Static Pressure If you don't know, see page 29, where S. Konzo gives a full explanation and much related data.

*

Do you know how to figure a cooling job using cold water? If you are interested in a step-by-step article on the calculations turn to page 32 where an actual job is worked out in detail.

*

That cold water cooling can be sold when intelligently presented is proved, we think, by the story of a successful campaign as related on page 34. See if you don't think this contractor has a smart idea.

*

We conclude our discussion of controls for water cooling systems on page 36. Beginning soon we will talk about contros for compressor systems.

*

Did you follow the series on Night Air Cooling? The last article of the series is on page 38. Perhaps we will add another on use of basement blowers. Would you like such an article?


# AMERICAN ARTISAN

With which is merged

FURNACES and SHEET METALS AND Warm-Air Heating

Covering All Activities in

Gravity Warm Air Heating — Forced Warm Air Heating
Sheet Metal Contracting — Ventilating
Air Conditioning

J. D. Wilder, Editor

Vol. 104, No. 8 — August, 1935 — Founded 1880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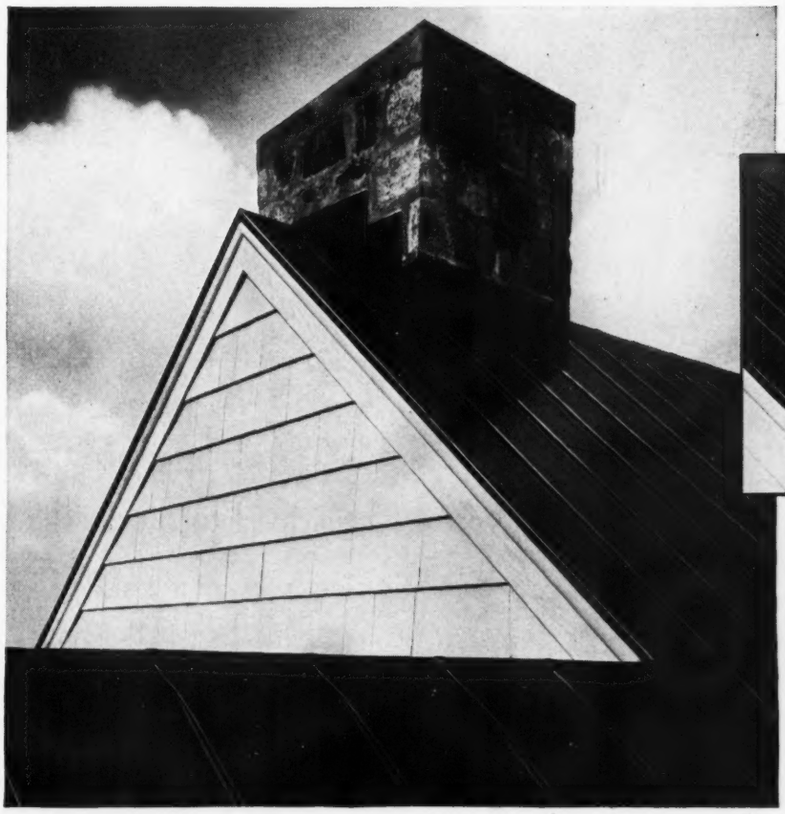
*Your Opportunity for Metal Roofing Business*

# ANACONDA ECONOMY *Cottage Roofing*



Familiarize yourself with Anaconda 10-oz. *Economy* Cottage Roofing. Our new Anaconda Publication C-7 describes it in complete detail. Fully illustrated. Read it . . . *study* it! A free copy will be mailed on request.

ANACONDA
from mine to consumer

YOU now have an *opportunity* to get into the residential roofing business. Metal roofs are coming back! Not the tin roofs of other years, but durable, *rustless* roofs of Copper! The time is right for promoting the use of Anaconda 10-oz. *Economy* Cottage Roofing. The National Housing Act will help. The architectural profession is expected to favor this new type of roofing. And the general public is "copper conscious."

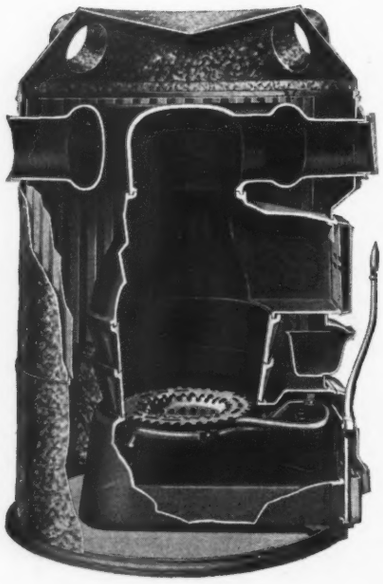
Distributors of Anaconda Copper stock Anaconda 10-oz. *Economy* Cottage Roofing. Contact your supply house now, for complete price and installation data. Promote the sale of this new product in your community. It's your opportunity for new and profitable business.

THE AMERICAN BRASS COMPANY
General Offices: Waterbury, Connecticut
*Offices and Agencies in Principal Cities*

ANACONDA COPPER

# You Can Be a 100%

## ...with the 100% MONCRIEF FURNACES AND AIR CONDITIONING SYSTEMS



## ★ MONCRIEF Series "C" Cast Furnace

Here is a 100% furnace in every particular. . . Only four joints inside the casing. . . Extra heavy long-fire-travel radiator, cast entirely in one piece. . . Large one-piece feed section. . . Two-piece ribbed fire pot. . . Duplex roller bearing grates with upright shaker handle; or 4-bar rocker grates. . . Roomy one-piece ash pit. . . Casing is lined down to grate level . . . Cast slip-on front, in two pieces, fits tightly in place without a single bolt.

WITH the 100% complete Moncrief line you are equipped to supply the furnace and air conditioning system needs of any and every home owner in your community. Every unit bearing the Moncrief name is strictly modern in design, attractively finished, and quality made — priced to give the home owner big value and you a good profit.

## OTHER 100% MONCRIEF LEADERS

Gas Air Conditioning Systems

Series "B" Gas Furnaces

Series "S" "D" and "E" Steel Furnaces

Pipe and Fittings for Gravity Jobs and Air Conditioning Systems

## New— MONCRIEF Air Conditioning Pipe and Fittings *with special lock joints.* Send for catalog just off the press.

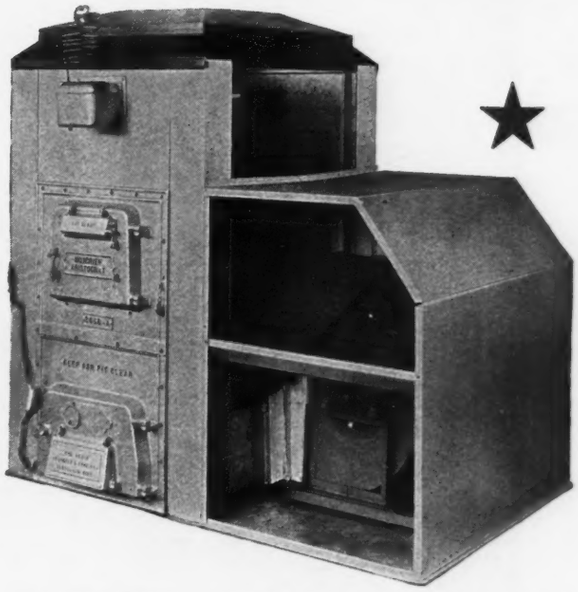
## WE SUPPLY EVERYTHING used on a Warm Air Heating Job

Mail the coupon for information

# % Furnace Dealer...

## MONCRIEF Artistocrat Leads the Winter Air Conditioning Field

You can give the home owner 100% value in air conditioning with the Aristocrat. Heating unit either Series "S" steel or Series "C" cast Moncrief Furnace. Filters, quiet running blower and Moncrief Automatic Humidifier contribute to make this a superior air conditioning system in every particular.



MONCRIEF ARISTOCRAT AIR CONDITIONING SYSTEM WITH PANEL REMOVED SHOWING SERIES "S" FURNACE, FILTERS AND BLOWER.

### MONCRIEF Gas Air Conditioning System

Automatic heat at its best is attained with this unit. Striking economies, too, are effected by special design of burners and heating chambers. Beautifully finished in green and black crackle. Nine sizes.

## *New*--Latest Addition to the Moncrief Line

### ★ Moncrief Aristocrat OIL FIRE Winter Air Conditioner

Specially designed for use with any standard make oil burner. . . Heavy steel furnace is securely welded, permanently gas tight. . . Extra long-fire-travel radiator makes for highest efficiency. . . Front is designed to make installing of burner simple and convenient. . . Attractively finished in red and black crackle. . . A superior unit in every way.

*Send Coupon for money-making literature*

Supplied as illustrated above and also with vestibule which encloses oil burner and entire front.

**The Henry Furnace & Foundry Co.**
3473 E. 49th St. Cleveland, Ohio

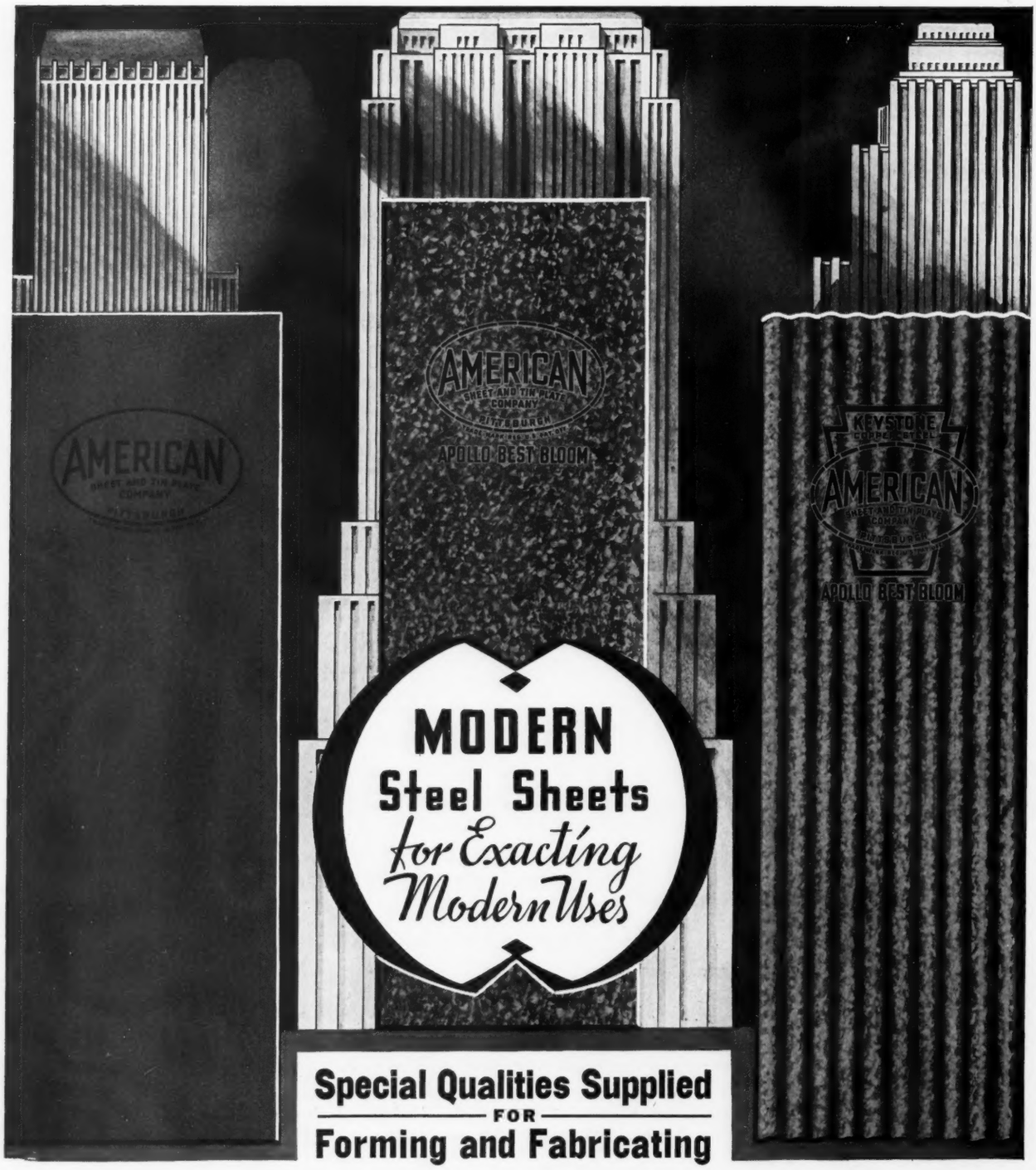
The Henry Furnace & Foundry Co.
3473 E. 49th St., Cleveland, Ohio
Send me descriptive literature and prices on the items checked below.

- ☐ Series "C" Cast Furnaces
- ☐ Series "S" Steel Furnaces
- ☐ Gravity Job Pipe and Fittings
- ☐ Aristocrat Air Conditioners
- ☐ Aristocrat Oil Fire Air Conditioner
- ☐ Air Conditioning Pipe and Fittings
- ☐ Series "B" Gas Furnaces
- ☐ Blower-Filter Units
- ☐ Moncrief Automatic Humidifiers

Names .....

Address .....

City ..... State .....




AMERICAN Products are well made in every particular, with close adherence to uniform quality standards—the kind that pleases both in shop and in service. Supplied in Black and Galvanized Sheets, Special Sheets, Formed Roofing and Siding Products, Tin and Terne Plates for all purposes; also KEYSTONE Copper Steel products offering maximum resistance to rust. Sold by leading metal merchants.

## AMERICAN SHEET AND TIN PLATE COMPANY, Pittsburgh, Pa.

STEEL SHEETS ALSO PRODUCED

In the South by TENNESSEE COAL, IRON & RAILROAD CO. Birmingham, Ala.

On the Pacific Coast by COLUMBIA STEEL COMPANY San Francisco, Calif.

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United States Steel Corporation Subsidiaries

| 1935 | September | | | | | 1935 |
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# HARVEST TIME!

**The next ninety days give every promise of being the most profitable "Harvest Time" that furnace men have enjoyed in recent years. More new buildings and more improvements are being made RIGHT NOW than have been made since 1930—and there are thousands and thousands of worn-out furnaces that will HAVE to be replaced before another season's firing!**

## DEALERS WHO SELL THE WEIR ARE "ALL SET" WITH A COMPLETE LINE FOR EVERY FUEL AND FOR EVERY PURSE—

**And you have features to sell that put all competition at a disadvantage. STEEL construction — Riveted AND WELDED seams—never any gas or fume leakage—never any "re-setting" bills—and an assured fuel saving that can be SEEN and PROVEN.**

**YES! You DO have something better to sell—and we give you abundant selling help. A NEW, POWERFUL, FAST SERIES OF DEALER ADS IS READY RIGHT NOW and we also give direct-mail help and the personal services of a corps of field representatives who are trained in *engineering* and *selling*.**

**THE ANSWER TO "HOW TO GET THE CASH"**

We are prepared to finance your contracts for you thru our own Finance Company.

Lowest Rates.
No Down Payment.
3 Years to Pay.
No Red Tape—No Delay.
No Reserve—No Recourse.
Let us send full details.
Ask for Bulletin A. F.

**Decide NOW that if the WEIR franchise is still available in your town YOU'LL GET IT—then ACT—and the next three months will BRING YOU UP TO THANKSGIVING AND CHRISTMAS IN THE RIGHT FRAME OF MIND!**

THE MEYER FURNACE COMPANY
PEORIA, ILLINOIS

Established 1866—Mfrs. of
WEIR and MEYER Steel Furnaces—Domestic Air-Conditioning Appliances For Coal—Oil—Gas.

**TEAR OFF THIS STRIP AND MAIL: SEND US ALL DETAILS OF THE WEIR PROPOSITION AT ONCE** (Sign on margin or enclose with letter-head.)

# You haven't a Chance

**Millions of dollars' worth of property is destroyed annually by wear, weather and corrosion because penny-wise and pound-foolish buyers gamble on "sheet metal" solely on the basis of price or, worse still, guess work.**

**It's costly to take chances—it's needless and expensive to experiment. Make GOHI Pure Iron-Copper Alloy your permanent specification and defeat wear, weather and corrosion with the longest-lived, low cost ferrous metal you can buy.**

**Your decision to use GOHI is supported by the evidence of more than a quarter century of unmatched performance under the severest conditions. Get all the facts. Write today!**

GENUINE OPEN HEARTH IRON
GOHI
PURE IRON - COPPER ALLOY
REG. U.S. PAT. OFF.

*GOHI Pure Iron-Copper Alloy is available in all sizes and gauges. Produced exclusively by The Newport Rolling Mill Company Newport, Kentucky.*

# GOHI

PRONOUNCED "GO-HIGH"

# SHEET METAL

THE NEWPORT ROLLING MILL COMPANY . . . NEWPORT, KENTUCKY

# THE FURNACE

## THAT THE TRADE HAS BEEN WAITING FOR!

## SERIES A...
## WISE WARM AIR FURNACE

**Exclusive features . . . distinctive design . . . increased efficiency . . . greater economy . . . easier to operate . . . exceptional durability . . . ALL built into and found only in this New Series A Wise Furnace. It is in a class by itself. It is the result of over 30 years of successful furnace building. It is Wise's answer to the modern demand for something different and better in furnace construction.**

### FEATURES . . .

### NEW ONE-PIECE SELF CLEANING RADIATOR

- Flues open into the combustion chamber . . . radiator does not fill up with dirt and soot . . . provides larger combustion chamber and more prime heating surface.

### NEW ASHPIT AND LOWER FRONT

- Cast in one piece it eliminates the joint between ashpit and front. Makes installation very simple and assures perfect alignment of fronts.

### ONE-PIECE CELLULAR FIREPOT

- Air cell firepot, which University tests have proven to be at least 9% more efficient than the solid type.

### DOMESTIC HOT WATER

- Provision is made for a cast iron water heater designed to fit into top feed section. This new feature is available at a slight additional cost.

## THE WISE OWL HAS SPOKEN . . .

and wise dealers will pin the coupon to their letterhead and mail it to us at once to secure complete information on our Exclusive Dealer Franchise Plan. . . . For Wise dealers will have something outstanding to sell that will return handsome profits. Investigate this New Wise Series A Furnace. Use it and the F. H. A. Finance Plan to build business.

**MAIL THIS COUPON**

Wise Furnace Company
Akron, Ohio

Send complete information on New Series A Furnace and Wise Exclusive Dealer Franchise Plan at once.

Name .....

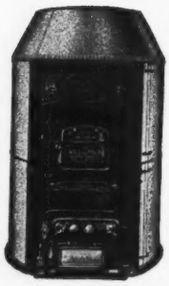
Address .....

City ..... State .....

## WISE FURNACE COMPANY, AKRON, OHIO

# Win with WILLIAMSON

## 1 WILLIAMSON "AA" CAST FURNACE

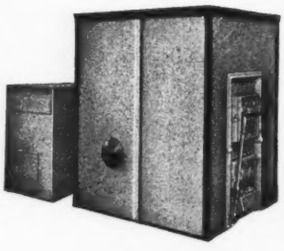


**You give your customers many dollars in extra value with this Model "AA" Cast Furnace. Automatic Humidity Pan Filler and other new features at no extra cost. A new alloy iron used in firepots and grates adds years of life to these parts.**

## 2 WILLIAMSON BOILER-PLATE FURNACE

**This steel furnace has been strengthened and reinforced at points where other steel furnaces gave trouble. Seams are both riveted and welded insuring dust-tight and gas-tight construction.**

## 3 WILLIAMSON AIR-CONDITIONING UNITS



**Williamson Air Conditioning Units enable you to meet the new competition on your own ground, whether the requirement is for a new installation or conversion job. The Williamson Patented Piping System is an important improvement that gives you an advantage.**

## 4 FAVORITE FURNACE FITTINGS

**Our modern facilities for the production of fittings in large volume enables us to supply superior quality at competitive prices. More than 40 years experience in the designing and manufacture of fittings are back of FAVORITE Fittings.**

## A Complete Merchandising Plan for Warm Air Heating Men

**To meet the NEW conditions under which business is now operating, you need NEW Methods—NEW Merchandise and RENEWED Enthusiasm.**

**WILLIAMSON—with a background of over half a century of success in all branches of the warm air heating industry completely satisfies these requirements. To progressive Dealers we offer a NEW Opportunity to win NEW Profits. If you are interested, write today to Dept. C**

## 5 WILLIAMSON PAYMENT PLAN

**A Deferred Payment Plan is essential to the successful operation of a modern retail furnace business. The WILLIAMSON Plan, with one of the lowest rates in the country, has proved to be outstandingly successful through depression as well as prosperous years. Many Dealers have built their business on it.**

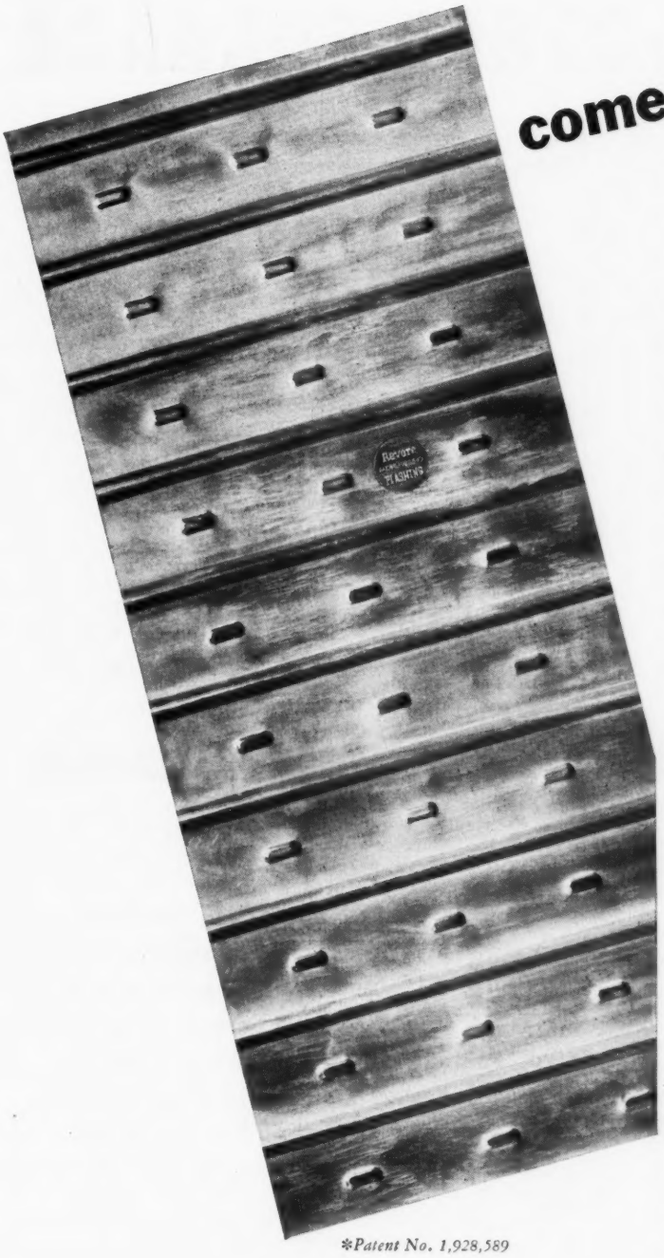
SUMMER SALES

**With this plan, you can make spring and summer installations with monthly payments beginning October 1st.**

THE WILLIAMSON HEATER COMPANY
337 WEST 5TH ST. CINCINNATI, OHIO

OVER A HALF CENTURY OF SERVICE

# REVERE Thru-Wall Flashing*




*Patent No. 1,928,589*

## comes in FLAT sheets

The new **Revere Thru-Wall Flashing*** is always furnished in flat sheets . . . and the sheet metal contractor can cut, form and bend it to any shape desired, in his own shop with his everyday equipment.

This eliminates special orders for the several types of flashing which are, as a rule, necessary to meet ordinary flashing requirements. Thus time is saved and delays eliminated.

Revere flashing is available in standard widths from 8 to 36 inches. The over-all length is 74 inches. When laid up with two-inch overlap, it measures 72 inches. The sheets nest tightly (25 to one inch) which makes this flashing easy to handle, store and transport to the job.

The flashing is made of Revere copper (soft temper) or non-staining Revere Leadtex (lead-coated sheet copper). It is designed with parallel rolled ribs at three-inch intervals across the full width of the flashing. Between the ribs are embossings. These ribs and embossings make an unusually tight bond between mortar and flashing, prevent all lateral movement of the wall, take care of expansion and contraction, and allow water to drain off quickly.

The design of the flashing also permits a water-tight interlocking joint with two-inch overlap to form a continuous flashing without the use of solder.

Revere distributors in all sections of the country carry Revere Thru-Wall Flashing in stock. They can also supply the famous Cheney Flashing, now reduced in price. These two flashings answer your needs for any and all types of construction. Write for details and specifications on these flashings.

# Revere Copper *and* Brass

INCORPORATED

*Founded by Paul Revere 1801*

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View of interior of new 500 Series Sunbeam Steel Furnace

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Volume 104

Number 8

# AMERICAN ARTISAN

## Installation Ordinances

A very noticeable trend has become evident, especially in the medium sized cities, toward the incorporation in city codes of regulations covering the design and installation of gravity and forced air heating plants. The trend has come about because organizations of contractors have lobbied for passage of these acts which aim to increase the general quality of the work going in.

The city of Dayton, Ohio, has just passed such an installation code. This ordinance incorporates numerous features of value, with provisions made for effecting such changes as may be needed. The ordinance is based on the Standard Code for gravity installations and upon other Dayton building code rulings. Excellent provision seems to have been made for honest examination, fair dealings, intelligent inspection and thorough enforcement. Especial attention is called to the fact that two warm air heating contractors are included in the board of examiners.

No good installer need fear such an ordinance. The purpose is to protect the home owner from the unscrupulous contractor who endangers the health, and safety of the buyer who cannot be expected to know how installations should be made. Buyers are at the mercy of these sharp operators, but through proper examination, licensing and provision for inspection such sharp practices can be unearthed and the buyer protected.

It seems likely that more and more such ordinaces will be passed. The industry, with its experience under codes, appreciates how beneficial is the removal of this class of operator. In the August 17, 1931 issue of AMERICAN ARTISAN we suggested licensing laws as one solution to our problems. Protests were made principally on the premise that every man has a right to engage in business, but overlooking the fact that ignorance of proper installing can be decidedly harmful and that the only way to educate some men is to make them study for an examination and then check up on them afterwards.

Since that suggestion was made numerous such ordinances have been passed. existing ordinances have been strengthened and many are being considered. The industry and cities seem to have awakened to the importance of protection for the man who keeps the wheels turning—the home owner.

◆

## Old Customers

In the June issue we suggested that a profitable source of work can be found among the old customers most firms work for regularly, but too often fail to keep in touch with. A number of interesting letters have been received telling of actual experiences with this idea and proving, as we expected, that the plan is by no means new.

One of the most interesting examples of small customer contact is cited by a firm in Oklahoma City, interesting enough, we think, to publish a resumé of the activities and methods used. The story of this firm's activities is published in this issue.

The point of most value cited by the writers is that in times like those of the past three years, many small contracts, secured at a profit, are far more valuable than a few larger jobs taken at such a low price that profit either does not materialize or is finally secured at great worry.

It is timely now, with fall approaching, to emphasize again another angle—the cleaning and repairing of furnaces. While many contractors have already cleaned and put in order large numbers of old customer's furnaces, the industry will again be faced with the task of cleaning many furnaces at rush speed, because owners either were not sold or would not listen to the advantage of spring or summer cleaning.

◆

## An Obligation

Many contractors have already read or been notified that a movement is on foot to collect money to reimburse those men of the industry who gave their own time and money to further the organization of our code and its installation. To some of these men the industry owes many hundreds or thousands of dollars.

Most of these men could no more afford the money they spent than could others of the industry, but being the kind of men they are, they put the industry ahead of self. Those who know these men personally know that most of them never expected to get any particular glory, or financial gain from the code, but did feel that the elimination of unfair practices and the setting up of machinery which might insure profitable work was an undertaking worthy of the best a man could offer.

These men did a job for which they received small thanks—frequently the bitterest kind of criticism. Whether or not they were chosen fairly or represented the industry proportionately, does not alter the fact that their money has been spent and all means of collection has been wiped out.

# Better Weather Protection

**A series of illustrated reference sheets selected from recommended practices in use in the industry. The facing page shows details of the methods for flashing chimneys on roofs of several kinds of materials. Emphasis is given the minor details often overlooked.**

✦ ✦

IN the weather protection for buildings, especially structures with pitched roofs, the correct flashing of chimneys is highly important because chimneys constitute a source of water entrance. While the proper flashing of a chimney is a relatively simple matter, too often minor details are overlooked with the result that water enters the space below the roof after wind and the drying out of mastic materials plus the curling effect of sun on shingles has hastened the deterioration.

The composite drawing facing shows recommended methods of chimney flashing for use with copper, lead, zinc, and iron on roofs of different materials.

Fig. 1 shows a chimney cut through a pitched roof between eave and ridge and away from any valleys. The roofing material is metal tile or any metal formed in small units. Recommendations call for folding back the shingles at least 4 inches below the foot of the chimney, at least 4 inches from the sides and at least 15 inches from the top chimney edge. The sheathing is carried up to the chimney.

### Chimney Collar

The first operation for flashing the chimney in Fig. 1 is to cut a solid sheet 19 inches longer and 8 inches wider than the chimney dimensions plus metal to turn up around the brick and additional metal for locking with the roofing material on all four sides. See Fig. 2. The piece is slipped down over the chimney or in cases of large chimneys, the sheet is composed of smaller units placed and then soldered into a solid sheet.

Against the brick the collar is pounded tight. Then step flashing as a capping for the collar is inserted in the proper mortar joints and cut to the pitch of the roof along the bottom. These step flashing units should be overlapped in the direction of the roof slope.

The metal shingles are then locked along the bottom of the chimney to the flashing sheet as shown in Fig. 3 and the flashing is locked double into the flashing on the two sides and along the top.

In Fig. 4 a chimney straddles the ridge of a roof covered with any type of shingle. The base flashing is one large sheet, either made from a single sheet of metal or made of several small pieces which are locked and soldered into a single piece when laid. A collar made from several pieces is fitted around the chimney and made water-tight by means of a lapped and soldered joint with the base sheet.

Stepped cap flashing for the collar is then applied, lapping the cap over the base at least 4 inches and anchoring the top of each cap piece in a masonry joint. The roof shingles are then laid over the base flashing to lap at least 4 inches.

Where a chimney stands on the slope of a shingle roof, multiple flashing may be used as shown in Fig. 5. The cap flashing is built into the chimney as the brick is laid up and the pieces are stepped up the roof two joints at a time. The base flashing should then have a full width bottom and top piece as shown and as many side pieces as there are steps in the cap flashing. These side pieces are put behind the cap flashing at least three inches and should be wide enough to leave at least 4 inches of metal under the roof shingles. The side pieces are lapped as shingles are laid.

Fig. 6 shows recommended flashing where a chimney stands between battens on a metal clad roof. The flashing again is one-piece or several soldered pieces. The cap flashing is stepped into the chimney with a 3-inch lap. The flashing is soldered to the roofing sheets by flanging the lower edge to make a tight joint. It is well to watch, in this type of chimney, that the sides of the chimney are far enough from the battens to permit the drainage water to flow past.

Wherever chimneys stand on sloping roofs a "cricket," Fig. 7, above the chimney is recommended. This cricket or "saddle" as it is sometimes called, should be in one piece. The purpose is to eliminate a water or snow pocket. Wood framing is used for support. The metal is turned up against the chimney as a base flashing, with the cap flashing above lapped 4 inches. The saddle flashing is carried up under the shingles at least 6 inches with the top edge folded back on top to prevent water getting under the shingles. At the top corners of the chimney a base and cap flashing is inserted over which the saddle flashing is lapped and soldered, both on the slope and against the chimney and then cap flashed.

Fig. 8 shows the sides of a "cricket" flashed chimney and use of small units as described in Fig. 5.

### Chimneys on Batten Roofs

Figs. 9, 10, 11 and 12 show flashing for chimneys at various points on a batten type metal roof. The recommendations also apply for shingle roofs. In Fig. 9 where a chimney, between battens or standing seams, cuts through the end connections of the roofing sheets, the roofing sheets should be cut at point H (not less than 15 inches above the chimney) and at M (a short distance below the chimney). The base collar sheet described for Fig. 2 is then soldered to the smaller roofing sheet which fills the space from H to M. This

(*Continued on page 76*)

# CHIMNEYS

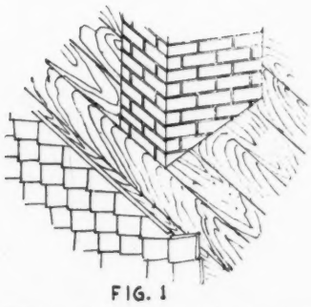


FIG. 1

Where chimneys protrude from sloping metal roofs, the metal should be stopped 4 inches below the chimney, 4 inches on the sides, 15 inches above.

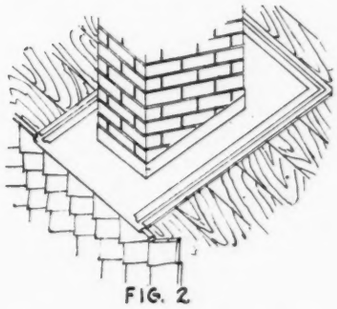


FIG. 2

A one-piece or multi-piece (soldered) collar like this is then placed around the chimney to take the roofing shingles and the stepped cap flashing.

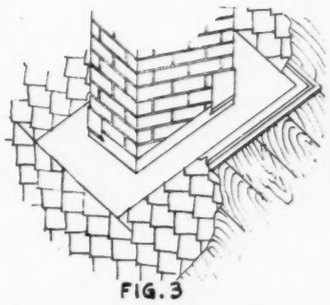


FIG. 3

Stepped flashing is then applied as the cap and the shingles are seamed to the four sides of the metal collar. Double locks at top and sides are recommended.

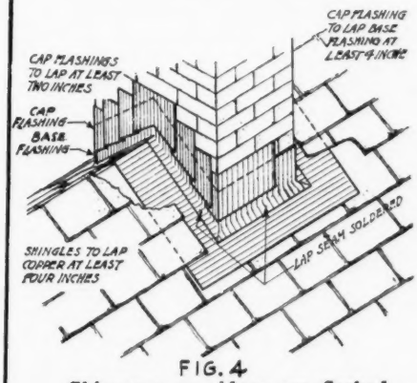

CAP FLASHINGS TO LAP AT LEAST TWO INCHES
CAP FLASHING TO LAP BASE FLASHING AT LEAST 4 INCHES
CAP FLASHING
BASE FLASHING
SHINGLES TO LAP COPPER AT LEAST FOUR INCHES
LAP SEAM SOLDERED

FIG. 4

Chimneys on ridges are flashed with a collar and step cap flashing. The collar is one-piece or multi-piece.

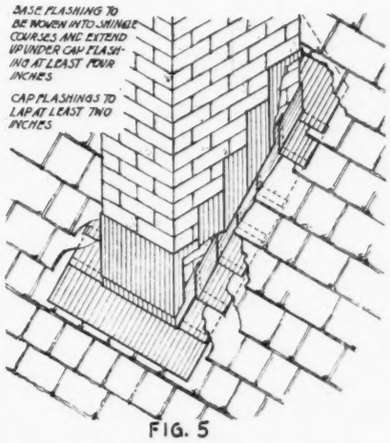

BASE FLASHING TO BE WOVEN INTO SHINGLE COURSES AND EXTEND UP UNDER CAP FLASHING AT LEAST FOUR INCHES
CAP FLASHINGS TO LAP AT LEAST TWO INCHES

FIG. 5

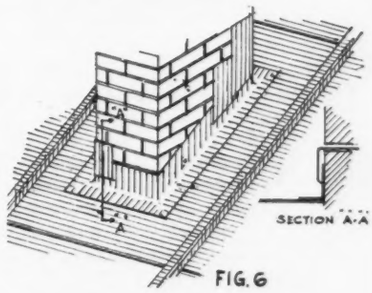



FIG. 6

Chimneys on batten-type, metal roofs should have a solid collar and pan sheet (formed by soldering as shown) and step cap flashing.

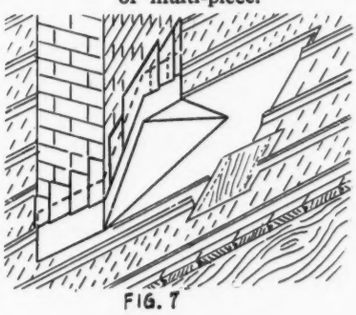


FIG. 7

Above—Method of step-flashing for caps and unit-flashing for the base, with single piece above and below.

Left—Formation of a "cricket" to direct water above chimney and prevent water or snow pocket.

Below — Four diagrams show method of flashing chimney on batten-type metal roof or in a valley. Text explains size of pan sheet required—the important feature of this practice

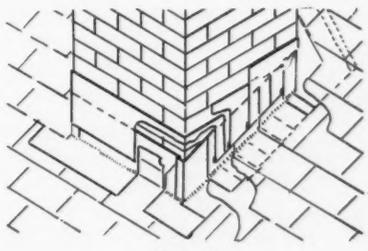


FIG. 8

Side flashing for chimney with cricket using unit type base flashing and step-cap flashing with single piece below.

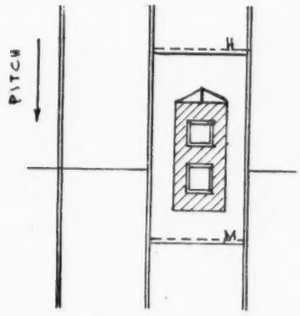



FIG. 9

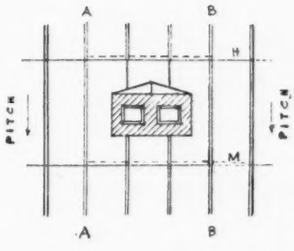



FIG. FO

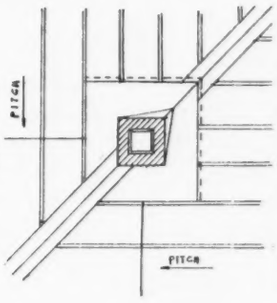



FIG. 11

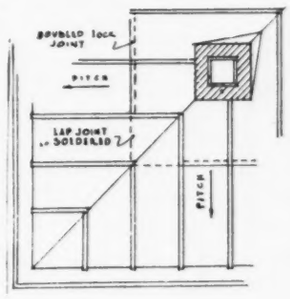
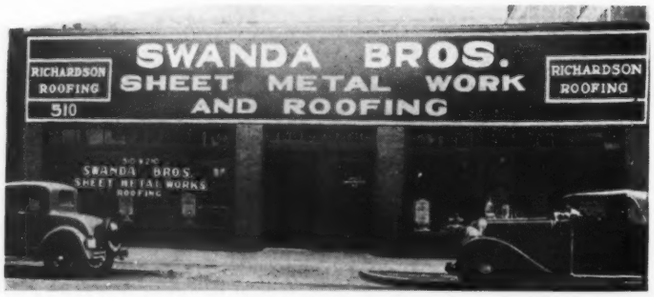
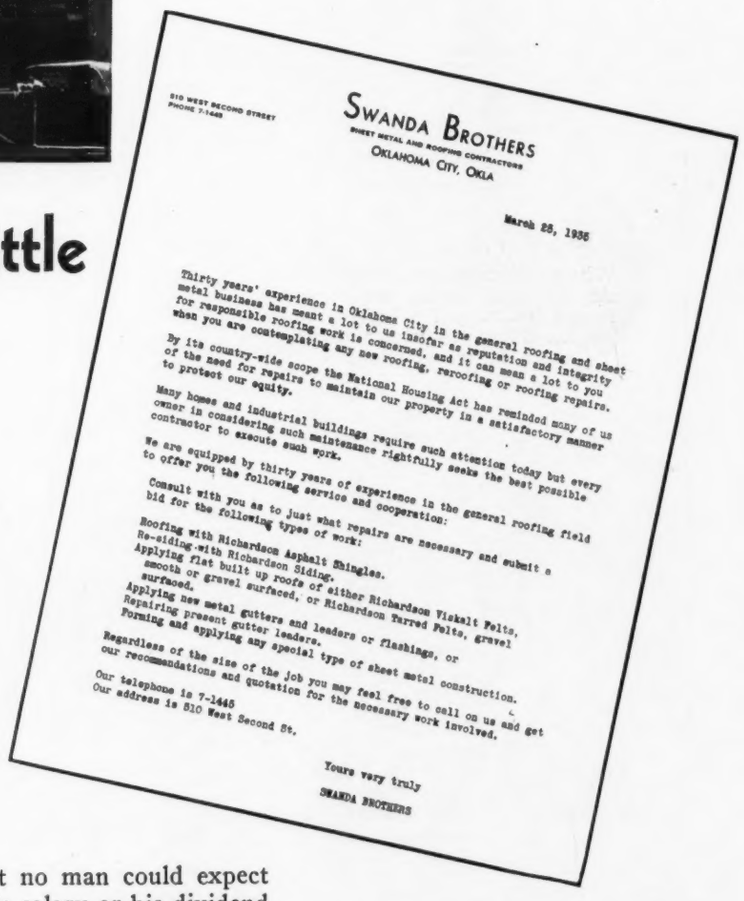



FIG. 12




**Left—Exterior of Swanda Bros. shop. Below—A typical letter used to maintain contact with the company's customers.**



510 WEST SECOND STREET
PHONE 7-1445

SWANDA BROTHERS
SHEET METAL AND ROOFING CONTRACTORS
OKLAHOMA CITY, OKLA

March 25, 1936

Thirty years' experience in Oklahoma City in the general roofing and sheet metal business has meant a lot to us insofar as reputation and integrity for responsible roofing work is concerned, and it can mean a lot to you when you are contemplating any new roofing, reroofing or roofing repairs.

By its country-wide scope the National Housing Act has reminded many of us of the need for repairs to maintain our property in a satisfactory manner to protect our equity.

Many homes and industrial buildings require such attention today but every owner in considering such maintenance rightfully seeks the best possible contractor to execute such work.

We are equipped by thirty years of experience in the general roofing field to offer you the following service and cooperation:

Consult with you as to just what repairs are necessary and submit a bid for the following types of work:

Roofing with Richardson Asphalt Shingles.
Re-siding with Richardson Siding.
Applying flat built up roofs of either Richardson Viskalt Felts, smooth or gravel surfaced, or Richardson Tarred Felts, gravel surfaced.
Applying new metal gutters and leaders or flashings, or
Repairing present gutter leaders.
Forming and applying any special type of sheet metal construction.

Regardless of the size of the job you may feel free to call on us and get our recommendations and quotation for the necessary work involved.

Our telephone is 7-1445
Our address is 510 West Second St.

Yours very truly
SWANDA BROTHERS

# "We Have 400 Little Customers On Our Books—and We Contact Most of Them Every 30 Days"

FRANK and Charles and Pete Swanda own the sheet metal firm in Oklahoma City, Oklahoma, known as Swanda Brothers. Fifteen men are connected with the concern in one capacity or another. Thirteen of these are relatives.

All of which is merely preliminary to the fact that the firm is a pioneer in the business and has made some money through all sorts of conditions, including the late era, because its owners and employes have co-operated in going out after business and finding it, even though it required late working and early rising.

### No Loafing Here

"We don't believe in sitting around in the office and shop and waiting for business to come in," explains Frank Swanda, who runs the office. "We have approximately four hundred so-called 'little' customers. If they don't telephone us or bring in some business within a reasonable period of time, we go out and ask why. Being relatives and long associated here in the business, we can be perfectly frank with each other. Long ago we decided that no man could expect to earn his salary or his dividend in the company and sit around in the office. We agree that there is no such thing as 'spare time' on our hands. If there is not enough business in the plant to keep us busy, we go out among these four hundred customers and get enough business to keep us on the job.

### We Live on Little Buyer

"We do not believe it is possible for the sheet metal concern to over-estimate the importance of the little customer and the list of such customers in its plan of doing business. Without our list of four hundred little customers, we would have been lost, especially during the past four years.

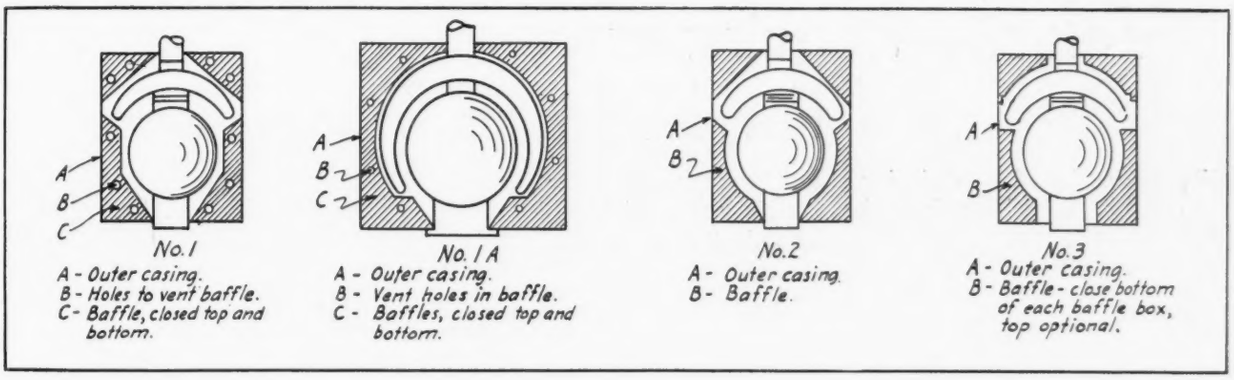
"Once a name gets on our customer list, we do not permit the owner of that name to forget us. We contact most of these customers as much as twice a month, because they are the type of customers who, ordinarily, buy in small quantity, but often. They include store owners, real estate owners, apartment house operators and others who need in the aggregate a considerable amount of sheet metal service in the course of a year, but seldom buy in large quantities.

"We contact these four hundred regular customers by three general methods," Mr. Swanda points out. "In the first place, when we're not otherwise busy, we get on the telephone and call certain of them; on others we make only personal calls, eliminating the telephone except in making appointments. To all of them we send direct mail advertising regularly.

### Detailed Record

"We keep an accurate record of each of these four hundred customers, so that we soon learn how best to contact each. Our record

(*Continued on page 74*)


A
B
C
No. 1
A - Outer casing.
B - Holes to vent baffle.
C - Baffle, closed top and bottom.
No. 1 A
A - Outer casing.
B - Vent holes in baffle.
C - Baffles, closed top and bottom.
No. 2
A - Outer casing.
B - Baffle.
No. 3
A - Outer casing.
B - Baffle - close bottom of each baffle box, top optional.

AMERICAN ARTISAN DATA SHEETS

# Some Suggested Baffling Practices [Part 2]

**Whenever a gravity furnace is converted to forced air, we should baffle the casing to insure that the faster moving air will impinge on the hot surfaces. If some air goes by without picking up heat, we have trouble. Here are several baffles for crescent-shaped radiator, steel furnace casings.**

IN the July issue we presented a number of suggestions for baffling short and long-wrap radiator steel furnaces when the furnace is converted from gravity to forced air. All drawings were for round casing installations.

It frequently happens that in the process of converting gravity to forced air the home owner also wishes to better the general appearance of his basement and is, therefore, receptive to the plan of making the furnace casing rectangular in shape and brightly painted. These rectangular casings require even more careful baffling than do the round casings because there is considerably more space through which the air can pass without picking up heat.

Baffling for forced air with rectangular casings follows pretty definite rules. First the corners must be blocked off as the corners constitute the spaces most troublesome. Then the size of the furnace, the fuel used and the amount of air passed through the casing are studied and used to determine the amount of free air area required for the job. In other words, using the same furnace and casing the baffles may be differently spaced or arranged from job to job as fuel, and c.f.m. vary.

We will give a resume of rules for determining free air area later. The drawings show some of the common forms of rectangular casing baffles. The sponsors of the suggested methods say:

## NUMBER 1

**A. H. Kundee, Premier Warm Air Heater Co. Dowagiac,, Mich.**

"Undoubtedly there are many gravity furnaces converted to forced air without using baffles and giving satisfactory results, however, we believe that baffling improves operation. The important thing to keep in mind is that any gravity cased furnace may give bonnet temperature variations unless a baffle is used, especially in the larger sizes where a large fan is attached. The more air, the more chance for some air getting by without picking up heat.

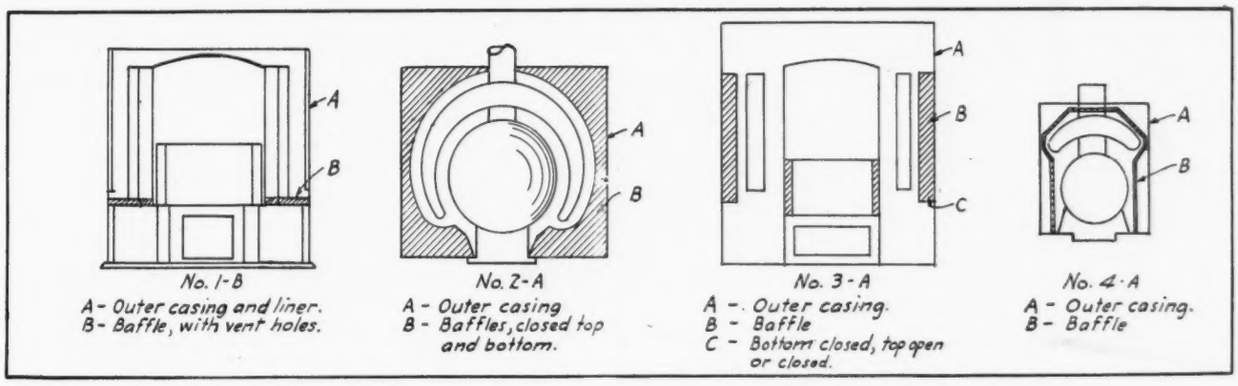
"We recommend the use of sharp bend corner baffles as shown in Fig 1, 1A and 1B. We feel that such baffles can be fabricated more cheaply than a baffle which attempts to follow the contour of the furnace exactly. The net result may not be 100 per cent but is plenty good enough. We suggest that small holes be cut through the top and bottom blocked in ends to permit some circulation of air through the box baffle. This reduces the air temperature within the baffle and gives a cooler casing."

## NUMBER 2

**Arthur W. Hunt, Contractor, Kansas City, Mo.**

"We use angular and semi-circular baffles in rectangular casings. The

(*Continued on page 72*)



# Velocity Requirements For Materials Transmission

CONTRACTORS designing and installing blow pipe and collecting systems for conveying materials are frequently confronted with the question— "what velocity do I need to keep the materials in suspension?"

If tables and charts are available the contractor can find the answer if the specific gravity of the material handled is known. Such tables however, are generally devised for flow through horizontal ducts, whereas in practice vertical sections of pipe, or steeply sloping sections are often encountered.

The answer to the question—what velocity—can be worked out mathematically or by using one of the two charts shown with this article. These charts were developed by J. M. Dallavalle, consultant, Cleveland, Ohio, and originally published in Heating, Piping and Air Conditioning.

The tests were made on four materials varying in weight from a specific gravity of 1.08 to 2.65. or, by weight from 43 to 165 pounds per cubic foot. Due to the fact that weight of the material is highly important in determining the velocities required to keep such materials afloat in an exhaust duct, we give some typical materials handled in collecting systems and their weights. See Table 1.

TABLE 1

| Material | Lb. per cu. ft. | Specific Gravity |
|---|---|---|
| Gases, Fumes | 15 | 0.75 |
| Carborundum | 195 | .... |
| Cellulose | 94 | .... |
| Barley, Corn | 37 | .... |
| Oats | 26 | .... |
| Rye, Wheat | 48 | .... |
| Coal (hard) | 98 | 1.8 |
| Coal (soft) | 85 | 1.5 |
| Cork | 15 | 0.26 |
| Cotton, loose | 30 | .... |
| Flour | 28 | .... |
| Iron | 442 | 7.9 |
| Leather | 56 | 1.02 |
| Paper | 58 | 1.15 |
| Rubber (shredded) | 27 | 2.0* |
| Sawdust | 13 | .... |
| Shavings | 15 | .... |
| Starch | 95 | 1.53 |

*Specific gravity of solid rubber.

In general, air speeds of from 3,000 to 15,000 feet per minute are used in blow pipe work. Most standard machines producing material which is collected have standard sizes of pipes and hoods. Further, depending upon the weight of the material, there is an empirical rule for air volumes as, for instance the ratio of 24 to 1 for shavings—meaning that 24 cubic feet of air is moved to transport one cubic foot of shavings.

The purpose of the tests under discussion was to establish a chart form or mathematical calculation which will tell how fast air must move to hold in suspension various

(*Continued on page 70*)

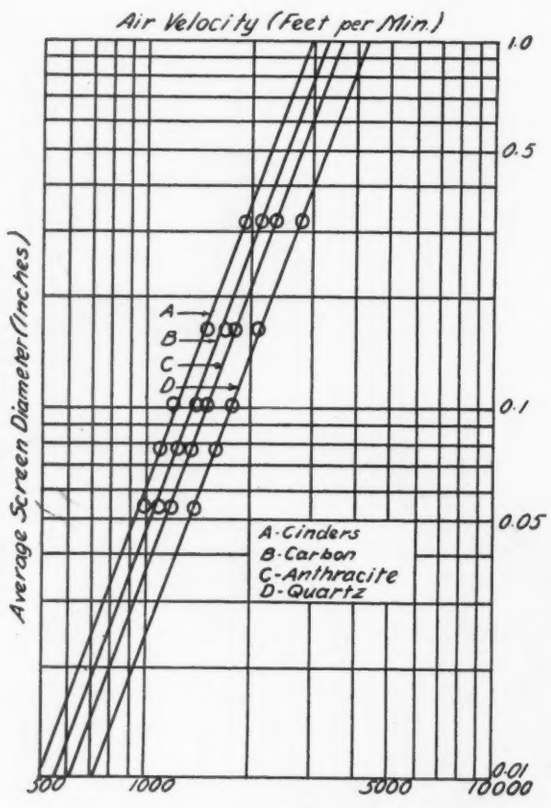



Chart showing required velocities for four materials in various sizes for suspension and transmission through horizontal ducts.

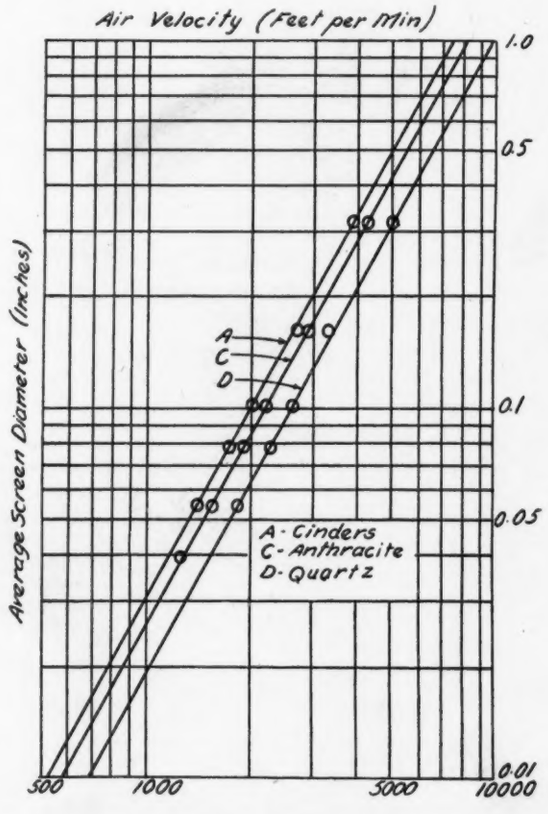



Chart showing required velocities for four materials in various sizes for suspension and transmission through vertical ducts.

# PIPE SIZES USED IN EXHAUST FAN WORK

*Branch pipes that exceed 25 feet in length require an additional 10 per cent increase in area capacity for each 20 feet so added.*

## Heavy Wood Working Machines of Standard Speed.

For Buzz, Pony or Diagonal Planers, Moulders, Jointers, Matchers and Stickers, Use one pipe for each set of knives.

| Length of Knives in inches | Diameter of Pipe in inches Upper cylinder | Diameter of Pipe in inches Lower cylinder |
|---|---|---|
| 5 | 4 | 4 |
| 10 | 5 | 5 |
| 14 | 6 | 5 |
| 24 | 7 | 6 |
| 30 | 7 to 8 | 7 to 8 |
| 36 | 9 to 10 | 9 to 10 |

For High speed Machines, provide pipes with 50 per cent greater area.
Timber Planers require 25 per cent larger pipe than ordinary planers.
Typical sizes are

| | |
|---|---|
| Tenoning Single Head | 5 inches |
| Tenoning Double Head | 7 inches |
| Tenoning Double End and Head | 10 inches |
| Shaper Single Head | 4½ inches |
| Shaper Double Head | 6 inches |
| Shaper Double Head Heavy Duty | 8 inches |
| Hog Planer up to 12-in. wide | 8 inches |
| Hog Planer over 12-in. wide | 12 inches |
| Tongue and Groover | 5 inches |
| Blind Rail Router | 5 inches |
| Panel Raiser each Head | 5 inches |

## Saw and Sander Pipe Connections

| Kind of Machine | Size of Machine | Diameter of Pipe in inches |
|---|---|---|
| Circular Saw | 12-in. Dia. | 4 |
| Circular Saw | 12 to 24 | 5 |
| Circular Saw | 24 to 40 | 6 |
| Rip and Resaw | Up to 14-in. Dia. | 4 |
| Rip and Resaw | 14 to 18 | 4½ |
| Rip and Resaw | 18 to 24 | 5 |
| Rip and Resaw | 42 to 60 | 8 |
| Band Saw | Up to 1½-in. wide | 4 |
| Band Saw | 1½ to 3-in. wide | 5 |
| Band Saw | 3 to 4-in wide | 6 |
| Band Saw | 4 to 6-in. wide | 7 to 8 |
| Swing Saw | | 4 to 6 |
| Miter Saw | | 4 |
| Gang Saw | as per size | 5 to 9 |
| Jig Saw | | 4 |
| Drum Sanders | 24-in long | 4 |
| Drum Sanders | 30-in. long | 5 |
| Drum Sanders | 36-in. long | 6 |
| Drum Sanders | 46-in. long | 8 |
| Drum Sanders | over 48-in. | 10 to 12 |
| Disc Sanders | 24-in. Dia. | 5 |
| Disc Sanders | 24 to 36 | 6 |
| Disc Sanders | 36 to 46 | 7 |
| Belt Sanders | up to 6-in wide | 4½ |
| Belt Sanders | 6 to 10 | 5 |
| Belt Sanders | 12 to 14 | 6 to 8 |
| Arm Sanders | | 4 |
| Floor Sweep | up | 6 |
| Floor Sweep | down | 6 |

## Pipe Sizes for Grinding Wheels

| Size of wheel in inches | Max grinding Surface | Diameter of pipe |
|---|---|---|
| 6 X 1-in thick | 19 square inches | 3 inches |
| 7 to 9 X 1½ | 43 square inches | 3½ inches |
| 10 to 16 X 2 | 101 square inches | 4 inches |
| 17 to 19 X 3 | 180 square inches | 4½ inches |
| 20 to 24 X 4 | 302 square inches | 5 inches |
| 25 to 30 X 5 | 472 square inches | 6 inches |

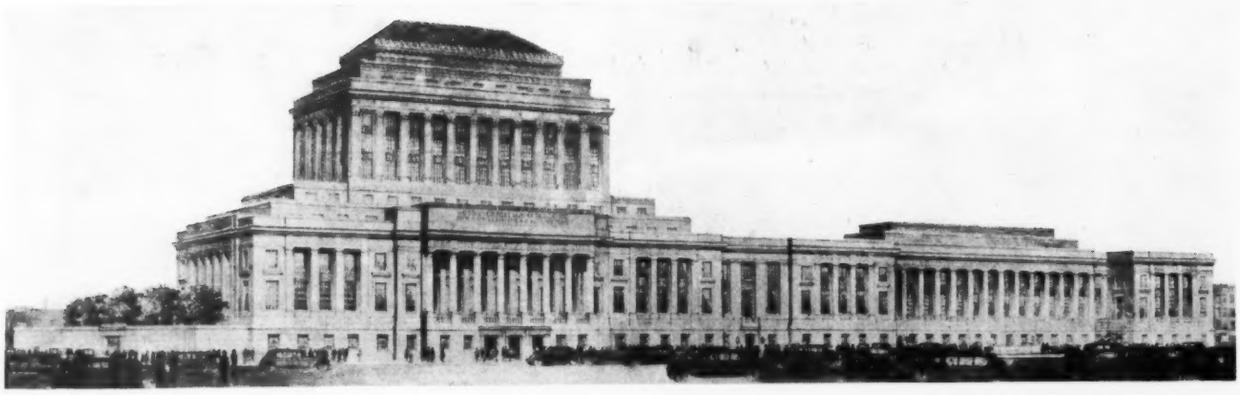
## Pipe Sizes for Buffing and Polishing with Rag Wheels

| Size of wheel | Grinding Surface | Diameter of pipe |
|---|---|---|
| 6 X 1 inch thick | 19 square inches | 3½ inches |
| 7 to 12 X 1½ | 57 square inches | 4 inches |
| 13 to 16 X 2 | 101 square inches | 4½ inches |
| 17 to 20 X 3 | 189 square inches | 5 inches |
| 21 to 24 X 4 | 302 square inches | 5 inches |
| 25 to 30 X 5 | 472 square inches | 6 inches |

## Velocity and Pressure for Conveying Materials

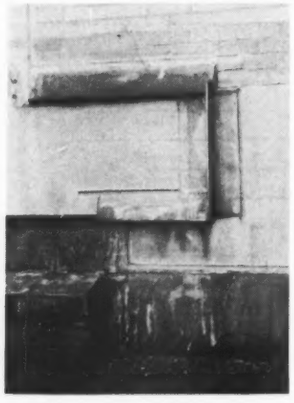
| Approx. duct velocity 70° air Feet per min. | Velocity pressure in duct inches water gauge | Class of work or materials handled |
|---|---|---|
| 2000 to 2500 | 0.39 | Gas, Fumes and very light materials. |
| 3000 | 0.58 | Cotton, wool and similar materials |
| 3500 | 0.76 | Shoe machinery, saw dust, light polishing and buffing wheels. |
| 4000 | 1.00 | Ordinary wood working exhaust systems, heavy polishing, buffing and grinding |
| 5000 | 1.55 | Heavy duty wood working or wet materials. |
| 6000 | 2.25 | Sand, grain, coal, lead dust, pulp chips etc |

*Plate from "Standard Practice in Sheet Metal Work." Reproduced by courtesy of book owners.*

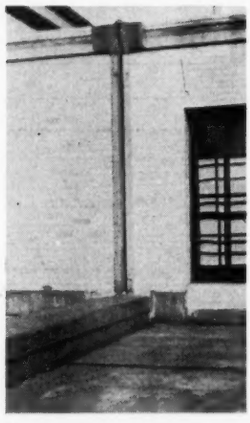


# Christian Science Monitor Building

A picture story of several of the interesting features of this excellently designed and erected building. The contractors were the E. Van Noorden Co. (sheet metal and roofing) and Cavanaugh & Early (sub-contractors for composition roofing). More than 50,000 pounds of lead coated copper was required —much of the metal buried. Of special interest are the expansion joints, through wall flashing and sheathing, capping, gutters, etc. The pictures show closeups of the most important work.

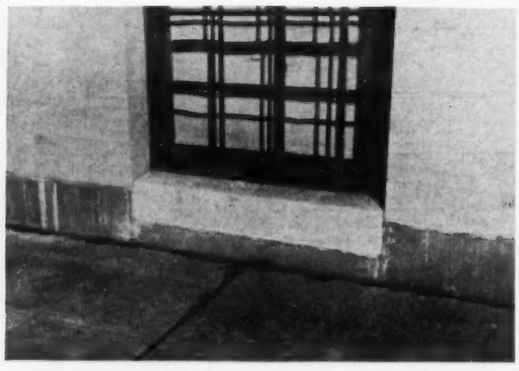


Expansion joint and hood, permitting free movement horizontally. Above the hood there is a concealed copper expansion joint in the wall.

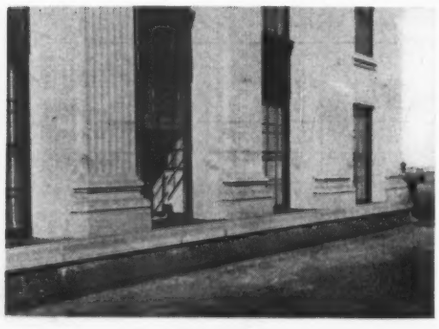


Roof expansion joint which continues on wall of clerestory as a wall expansion joint. Curbs were built on the roof and the low parapet is a combination fire wall and expansion cap.

Main roof looking east. The base flashing is locked to through flashing with a horizontal expansion lock. The roof is surfaced with granolithic slabs; midcenter is shown a skylight covering light shaft, with a lifting section to permit access to the machinery.



Base flashing locked to through flashing. Stone sill is underlaid with a copper pan.



Left—Base flashing following the contour of stone. Cross expansion locks are provided at intervals of approximately 50 ft. Flashing is locked at top to through flashing.

Right—At northwest corner shows base flashing which locks to through wall flashing. Roof is gravel surfaced.

# A Plan to Reimburse Code Leaders

THE decision of the Supreme Court declaring NRA unconstitutional has placed many of the sponsors and executives of the Roofing and Sheet Metal Contracting Industries Code, local and national, in a position wherein they have given freely of their time and have advanced their own money to defray traveling, mailing, printing, stenographic salaries and like expenses. These men advanced the money, relying on being reimbursed out of funds collected under code assessments.

As the possibility of enforcing collection of money by assessments was voided by the Supreme Court decision, the only hope of these men being repaid is in the building up of a fund by voluntary contributions by members of the industry.

### Who Spent Money?

The men who are out of pocket are in two classes: First, when the code idea originated, the industry was not organized sufficiently so that a code sponsoring committee could be properly elected. Under the circumstances, certain individuals among association executives, as for example, W. C. Markle, Secretary of the National Association of Sheet Metal Contractors, and W. S. Hays of the asbestos, slate and tile roofing contractors group, voluntarily undertook to formulate and have signed a code for the industry. This necessitated many trips to Washington, and as sufficient funds for expenses were not available Messrs. Markle, Hays and others, paid expenses out of their own pockets.

The second class includes men elected to serve on code administration, some nationally and others locally. As work had to be done in advance of collecting assessments, these men contributed their own money to meet the necessary expenses. In no instance have any salaries been paid to other than employees of code administrative committees, although in two instances, at least, the men had given their entire time for over two years to the code.

Exclusive of salaries, the out-of-pocket expenses of these men are approximately $60,000.

### A Suggested Plan

A Committee has been formed comprising the Editors of the following trade publications: American Artisan, American Roofer, Modern Roofing, National Sheet Metal Contractor, Sheet Metal Worker, Ingot Iron Shop News, to receive voluntary contributions to a fund to be used solely for the purpose of discharging the obligations to all code sponsors and executives, national and local, on a pro rata basis. For the protection of members of the committee, all checks should be drawn to the order of Joseph C. Gardner, Trustee (Mr. Gardner is a past president of the National Association of Sheet Metal Contractors) and marked "Code Expense Trust Fund." Such checks should be mailed to any one of the foregoing trade journals, which in turn will list these checks and send to Mr. Gardner for deposit, receiving a receipt therefor.

This plan has been proposed to facilitate checking and auditing of receipts. The endorsement on individual checks will serve as a receipt to the donor.

### Unaudited Accounts

Many of the out-of-pocket expense items have already been properly audited. Those who have similar items not already filed are requested to forward them to W. C. Markle, 429 Fourth Avenue, Pittsburgh, Pa., who served as secretary-treasurer of the National Code Authority. These additional items will then be audited and when all claims are approved, distribution will be made on a pro rata basis.

Money collected will be treated as a Trust Fund and cannot be used for any other purpose than for which it is collected.

# Our Cover Picture

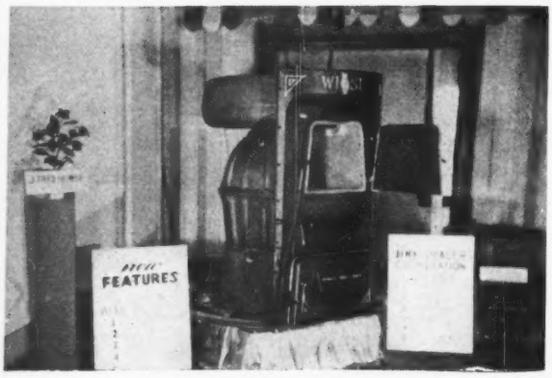
THE Wilshire Sheet Metal Works have attracted the attention of international news photograph agencies, and Henry Marx, proprietor, is now getting orders for his sheet metal silhouettes from various parts of the world, as a result.

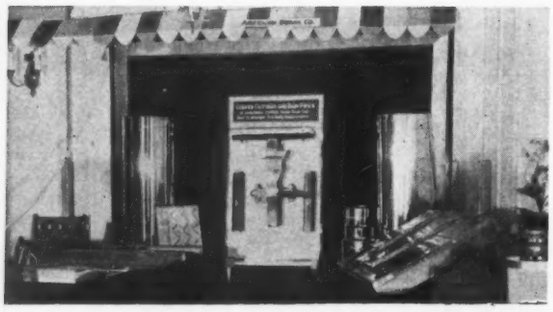
The Wilshire Sheet Metal Works is located on fashionable Wilshire Blvd., in Los Angeles, where Henry Marx has been supplying builders and householders with their sheet metal equipment for the past fifteen years.

His show windows are nattily dressed with the intriguing designs of gargoyles, weather vanes, finials, etc. Mr. Marx believes in advertising, as the pictures show, and he directs his promotional efforts towards the home owners since he is located in a residential district. The following are feattured in large letters on both sides of his white stucco building: Auto Drip Pans, Bread Drawers Lined, Repair Work, Specialty Work, Skylights, Eavetroughs, Down Spouts.

With about 39,000 motorists passing his store daily, Mr. Marx has succeeded in building up quite a business in sheet metal. The odds and ends of ornamental work, he says, are the "cream in his coffee," for these interesting shapes can be knocked together in spare time between jobs. He does a lot of this work himself, and likes to feature ships, children at play, old men smoking their pipes, or a man going hunting with his dog, in his silhouette weather vanes.

From left to right—D. A. Mannen, W. H. Lauer, C. Gundlach, Wm. E. Feiten Chas. Grote, H. Orton, J. Dersher, R. E. Barrett, A. E. Bogen.



# Ohio Stages Exposition Of the Industry

THIS year's annual convention of the Ohio Sheet Metal and Roofing Contractors' Association, held August 6, 7 and 8 in Toledo, was built around a new type of program featuring elaborate manufacturers' and distributors' displays, fewer addresses, more entertainment and increased facilities for the exchange of ideas among contractors assembling from all parts of the state.

Unquestionably, the principal feature of the meeting was the displays of equipment and materials. Twenty-eight manufacturers and distributors availed themselves of the opportunity to show new and improved equipment and materials.

A feature of the meeting was the entertainment provided. The salesman's party on Tuesday evening, open to both ladies and gentlemen, featured a lengthy program built around colored entertainment from a local Y.M.C.A. Boxing bouts, a knock-down and drag-out wrestling match, a battle royal by very small colored boys and plenty of refreshments kept the contractors amused.

Wednesday evening was devoted to a boat trip out into the lake, beginning early in the evening and returning about midnight. Dancing, refreshments and a chance to cool off under lake breezes brought out practically everyone attending the convention. The banquet of the final evening was very much in keeping with the previous excellent banquets staged by the Toledo local association and the State association.

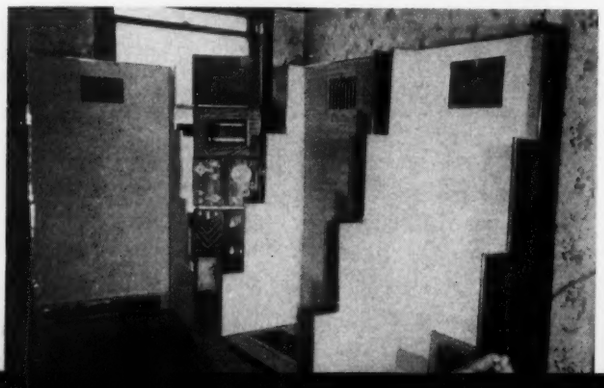
Very little routine business was undertaken at the convention. In accordance with past practice, the association elected ten directors who selected from their membership four men to serve as president, vice president, secretary and treasurer.

Among the many excellent papers was one by Dr. Ernest L. MacQuiddy of Omaha, Nebraska. Dr. MacQuiddy is a member of the staff of the municipal hospital in Omaha, has been engaged for many years in personal research in air conditioning and its effect upon health and comfort, particularly among those suffering from respiratory diseases.

### Air Conditioning

Dr. MacQuiddy made the statement that in air conditioning many of the claims made and machines sold are ridiculous. He asked the industry to consider air conditioning in the light of four fundamental principles—1. temperature control; 2. filtering and cleaning of air; 3. humidification and humidity control; 4. the circulation of air. Tracing briefly the history of heating, Dr. MacQuiddy stated despite the much longer span of years covered by heating, the cooling side of air conditioning up to date has at-

From Top-down, Displays by—J. M. & L. A. Osborn Co.; Wise Furnace Co.; American Brass Co.; Anderson & Krapp; Henry Furnace & Foundry Co.; U. S. Register Co. At right—Hart & Cooley Mfg. Co.



tracted the most attenton from the public, probably due to the more sensational features of cooling.

Dr. MacQuiddy made the statement that, in his opinion, humidification in the winter time is probably the biggest sales possibility the industry has at present. He pleaded with the industry to be honest with themselves and with the public and not to sell complete humidification when the only appartus installed consists of a water pan which under no possible condition can evaporate the amount of moisture required to maintain a desirable percentage of relative humidity during cold weather. The speaker pointed out that the medical world and scientists have claimed that 40 per cent relative humidity in the wintertime is the desirable condition but that practically no old houses and relatively few new houses can maintain 40 per cent relative humidity in zero or colder weather without objectionable condensation and frost on windows, walls and even on the furniture. Dr. MacQuiddy stated that he wished to challenge the A. S. H. & V. E. assertion that rapid change of temperature during the winter is responsible for most of the respiratory diseases. The speaker said that, in his hospital in Omaha, a considerable amount of data have been compiled on this condition and, so far as the hospital staff was able to determine the lack of adequate humidity was far more responsible for respiratory diseases than was the rapid change in temperature.

Dr. MacQuiddy explained many of the tests which he personally has conducted, pointing out that the bacteria, pollen, spores, dusts, dirt and other suspended materials, are actually very serious factors.

Of some amusement was Dr. MacQuiddy's assertion that the warm air heating industry has followed one procedure which, in the speaker's opinion, is entirely detrimental to the air conditioning industry—the practice of obtaining from doctors a list of patients suffering from respiratory diseases and selling these patients apparatus which is claimed to alleviate or cure respiratory disease. "This makes the warm air heating contractor a pseudo physician," declared Dr. MacQuiddy, "and a great deal of harm has been done by these pseudo physicians selling one machine or one idea as a cure-all for the dozens of types of respiratory diseases which are common." The speaker declared that this practice should be eliminated at once and that a much better practice would consist of the warm air heating contractor co-operating with physicians so that the physician makes the diagnosis and where the case could be definitely benefited by apparatus to cool air or air condition the contractor might then approach the customer without getting into difficulty.

An interesting feature dealt with the proposition of 100 per cent circulation, partial circulation and the use of 100 per cent outside air. Dr. MacQuiddy made the assertion that under tests in the hospital the 100 per cent recirculation system for cooling and cleaning was not satisfactory due to the gradual building up of odors. The partial recirculation was quite satisfactory so long as careful attention was given the operation of the apparatus. One hundred per cent outside air was quite satisfactory, in fact the most

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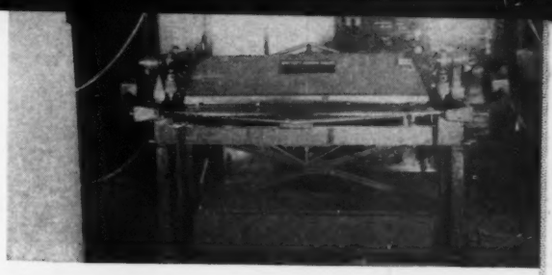
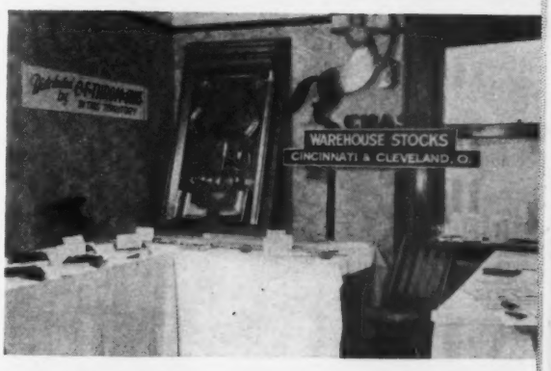
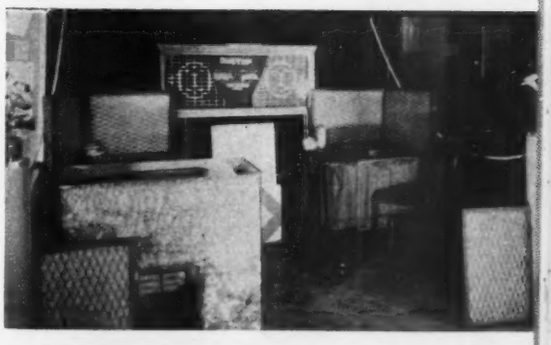
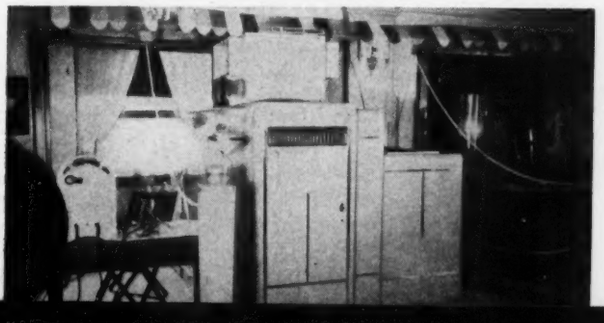
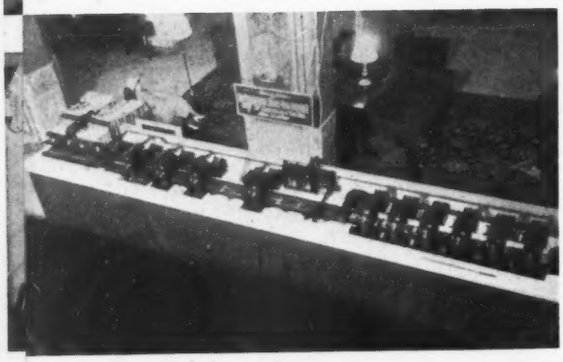


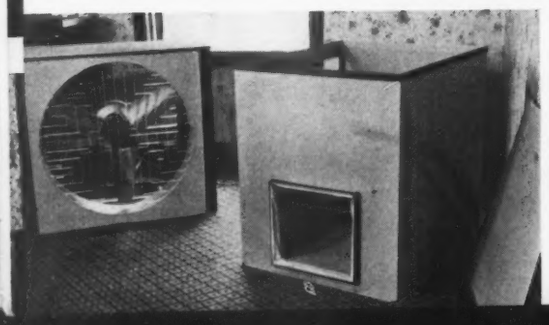




**From Top-down, Displays by—Whitney Metal Tool Co.; Chase Copper & Brass Co.; Owens-Illinois Glass Co. and The Furblo Co.; Forest City Foundries Co.; Revere Copper & Brass, Inc.; C. F. Throm & Sons at left — Fox Furnace Co.**





satisfactory of the three systems. Dr. MacQuiddy pointed out that the hospital has tested some twelve or fifteen types of filters and that only three or four types of filters have proved satisfactory for the conditions required. In his own home, Dr. MacQuiddy said that the longest practical life for a filter was six weeks. By this he did not mean that a filter would not remove dust and dirt after six weeks of use, but that filters would cease to remove pollen, spores, bacteria, etc., after six weeks' use.

### Copper

W. A. Gibson, Supervisor of Methods, Michigan Division, Revere Copper and Brass, Inc., presented several interesting facts on the metallurgy of copper. He showed a number of samples of hard and soft copper and explained how copper is designated as to degree of hardness. He also pointed out the uses to which various degress of hardness are especially adaptable and in answer to questions from the floor clarified several erroneous ideas on the most satisfactory application of hard and soft copper. Mr. Gibson also presented some interesting information on patina and made the statement that to get a good green patina requires from ten to fifteen years in industrial areas. The speaker explained some of the short-cut methods of obtaining patina by chemical treatment.

### Stainless Steel

D. C. O'Brien, American Rolling Mill Company, presented an interesting discussion based upon his personal observation of ways and means of handling stainless steel in the average sheet metal contractor's shop. Mr. O'Brien pointed out that shears and brakes must be set more closely. Shears must be sharp when stainless steel is handled. 18-8 stainless steel, however, can be handled in practically the same manner as mild steel sheets. Drilling holes in stainless steel sheets oftentimes results in trouble because the proper method of drilling consists of bringing the drill into contact with the sheet and maintaining a steady pressure of the drill until the hole is completed. The speaker pointed out that using special fluxes and the proper type of solder and iron eliminates most troubles and makes the soldering comparatively easy. Large irons should be used because stainless steel is a relatively poor conductor of heat. Ordinary fluxes have absolutely no effect on stainless steel. Special stainless steel fluxes are available and when used properly make possible rapid soldering operations. The speaker pointed out that these soldering fluxes and acids are comparatively severe in their action and that great care must be taken after the completion of the soldering operation to wash off all acid. A 5 to 10 percent of sal soda or a soap and water solution thoroughly applied and thoroughly rinsed and dried afterwards will eliminate all trouble from soldering acid or flux. The common type of 50-50 solder is not satisfactory for stainless steel but a 60-40 solder is better and a 70-30 solder is the best of the three.

Welding has been declared the most satisfactory method of joining stainless steel and for practically all purposes welding is more satisfactory than solder. Welding can be done by both the electrical and gas method and electric welding requires less voltage due to the higher resistance of the stainless steel sheet. Special welding rods should be used.

Mr. O'Brien gave information on a new semi-polished sheet of stainless steel and explained that the contractor by buying this sheet could save several cents a pound as compared to a No. 4 finish. Polishing can be done by means of a small buffing wheel used on an electric drill or electric grinder by the contractor either after fabrication or before fabrication.

"How the Sheet Metal Fabricator Can Cash in on Stainless Steel," was the subject of a pa-

(*Continued on page* 72)

**From Top-down, Displays by—Bostwick-Braun Co.; American Rolling Mill Co.; Republic Steel Corp.; Milcor Steel Co.; Republic Steel Corp.; Lau Heating Service, Inc.**

# Air Conditioning Section

**Devoted to the technical and merchandising problems of air conditioning in homes and small buildings**

THE past summer has been an important period in the development of cooling—industrial, commercial, domestic. The coming winter seems likely to be an equally important period in the advancement of winter air conditioning.

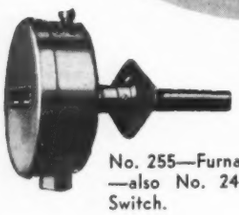
- - - Readers of American Artisan appreciate how diversified is this subject of air conditioning—how many are the subjects to be studied. In a section like this we can publish the most technical articles or we can publish articles covering the practical problems and necessary theory of design and installation.

- - - So far in the three and one-half years this section has been a regular part of American Artisan we have succeeded pretty well, we think, in keeping the material practical. Some of the material may not seem to be air conditioning to the technician, but it is air conditioning to us.

- - - We are planning, now, the articles for the coming winter. We would like to know what subjects you want to see discussed. Suggestions from readers will be appreciated.

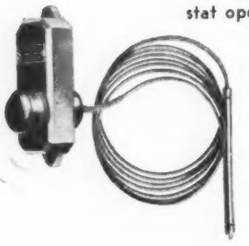
# GOOD CONTROLS are ESSENTIAL in Zone Heating

No. 431—Duct Damper Motor showing new mounting.



No. 255—Furnace Limit Switch —also No. 244 Furnace Fan Switch.

No. 691—Differential thermostat operates on the difference between outdoor and indoor temperatures for summer cooling.



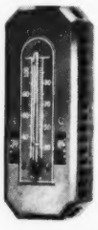
THE volume of business in zone heating is rapidly increasing because zone heating does have a strong appeal in added comfort and greater economy. It is applicable to present as well as new installations.

But in planning a zone heating installation, assure operating satisfaction with dependable controls — especially a noiseless duct damper motor which has ample power.

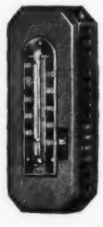
The New "Genuine Detroit" Duct Damper Motor is silent in operation. It may be mounted directly on the duct without the risk of objectionable noise. In the interest of easy installation the new mounting bracket accurately locates the shaft hole—no measurements are necessary.

The No. 431 keeps the burner or stoker operating as long as the thermostat in any zone calls for heat. Burner operation is not shut down until all zones are satisfied.

For further details on Zone Heating Controls, write for Bulletin 66.



No. 443 or 445—Thermostat for night and day or heating and cooling.



No. 444—Thermostat —2 wire.

**DETROIT LUBRICATOR COMPANY**

**DETROIT, MICHIGAN, U. S. A.** NEW YORK, N. Y.—40 West 40th St.

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# Forced Air Heating Facts From the Research Residence

By S. Konzo

**In this article, the ninth of the series, the author continues his explanatory articles on pressure measurements of air flow, with particular emphasis on static and total pressures. Test results about pressure losses in a forced-air heating system are comparatively meaningless unless the reader is at least partially familiar with the terminology, the units, and the limitations of air flow work.**

## What Is Static Pressure?

### Introduction

IN the July article, we considered to some extent the nature of "Velocity Pressure." In that article the following illustration was used:

"Now suppose that we imagine a case in which water is flowing in an open trough. That water has velocity; (Fig. 1) it moves; it can carry along with it other particles suspended in the water. If we should suddenly cap our hand over the end of

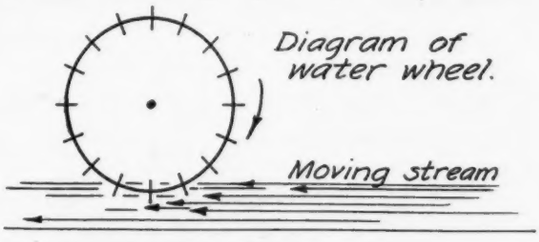



**Fig. 1—The Under-shot water wheel converts the velocity head of a moving stream of water into useful work.**

the trough and stop the flow of water, we would feel exerted against our hand a force, which is designated as velocity pressure or velocity head.

*"Velocity Head or Velocity Pressure* (abbreviated to V. P.) *is defined as that pressure which is required to create the velocity of flow.* Velocity pressure is dynamic, in the sense that it involves a movement of the particles composing the fluid."

### Nature of Static Pressure

The nature of "static pressure" is quite different from "velocity pressure." In fact the term "static pressure" implies a pressure which is at rest, whereas "velocity pressure" is a pressure which accompanies the movement of the fluid.

The installer of ventilating equipment and the designer of duct systems for forced-air heating systems encounter the term "static pressure" continually in their work. The static pressure difference, or loss, in a duct system is determined because static pressure is, under certain conditions, a measure of the frictional resistance imposed by the ducts to the flow of air. Fans are rated by the manufacturers, and fans are selected by the installer to work against a stated static pressure because static pressure is, under certain conditions, a measure of the pressure against which the fan will have to deliver its air. In fact the term "static pressure" is in continual use in the field. It behooves the installer to have a clear understanding of: what it

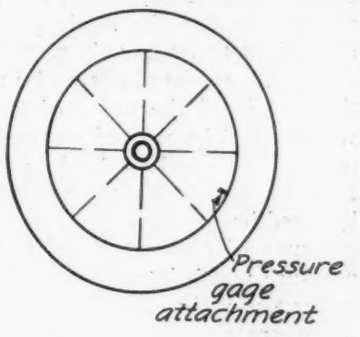



**Fig. 2—The air pressure in an automobile tire is "Static Pressure." It is dormant pressure, in that the pressure is not accompanied by the motion of the air.**

is, how it is measured, how it can be used, and what its limitations are.

*In simplest terms, static pressure* (abbreviated to S. P.) *is that pressure which tends to burst open the pipe or enclosure containing the fluid.*

### Examples of Static Pressure

The air in an automobile tire is under pressure. (Fig. 2). The term "30-lb. pressure" in the case of the automobile tire refers to a static pressure or

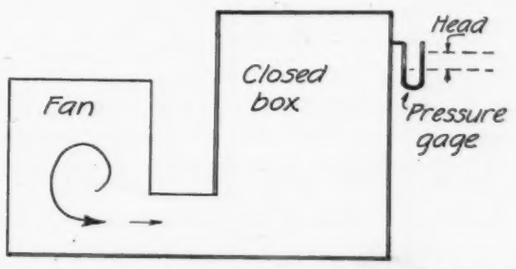



**Fig. 3—A fan that blows into a tightly sealed enclosure tends to build up "Static Pressure." That pressure is greater than the pressure of the surrounding atmosphere, and hence the pressure gage indicates a pressure difference between the inside and the outside of the box.**

"pressure which tends to burst," equivalent to 30-lb. per square inch. The pressure of water in a city main is similarly a static pressure, and is also stated in terms of "pounds per square inch."

Suppose that a fan or blower is attached to a box (Fig. 3) so that the air simply blows into the closed enclosure. A pressure will be built up, but since there is no outlet to the box, there will be no flow of air. The pressure which has been built up in the box is "static pressure." In this case, the velocity pressure is zero, because there is no movement of air.

The only difference between the pressure that

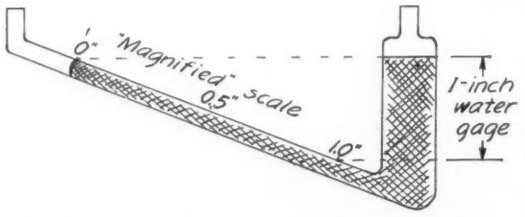



**Fig. 4—Simplified line diagram of inclined monometer or pressure gage.**

is built up in this box and the pressure that exists in the automobile tire in the example previously cited, is that of magnitude only. In the case of the automobile tire the static pressure was stated as equivalent to 30 pounds per square inch; whereas the static pressure built up by the fan blowing into the box is of the order of two inches or less of water. Just by way of comparison 1 inch of water pressure is equal to .03610 pounds of pressure so two inches water gage pressure would be seven hundredths of one pound. As stated previously, a pressure of "two inches water gage" refers to a pressure which is sufficient to support a column of water two inches in height. The magnitude of the static pressures ordinarily encountered in ventilation work and particularly in domestic heating installations is quite small and is ordinarily of the order of ⅛ in. to ⅝ in. of water.

### Measurement of Static Pressure

The measurement of static pressure is made with the same instrument that was described in detail in the previous issue. As is shown in Fig. 4,

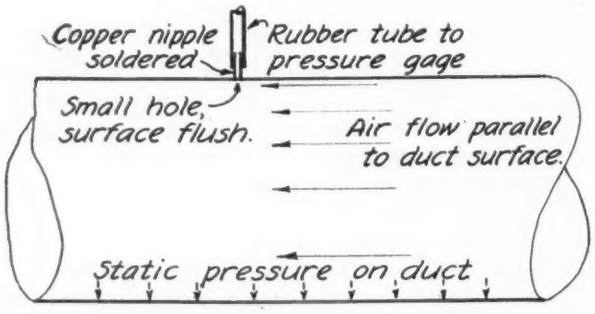

Copper nipple soldered
Rubber tube to pressure gage
Small hole, surface flush.
Air flow parallel to duct surface.
Static pressure on duct

**Fig. 5—The static pressure connection to a duct is also called a piezometer connection. The connection should be placed at right angles to the flow of air in order to avoid the impingement of air on the opening of the connection.**

a simple U-tube or inclined manometer (pronounced mah-nah'-me-ter) is attached to the box, enclosure, or pipe that contains the air. In this case, however, unlike the case of the measurement of the velocity pressure, the connection from one side of the manometer is made simply to the wall of the enclosure. A more detailed diagram of the connection to the duct is shown in Fig. 5. A connection of the sort shown in Fig. 5 is referred to as the "static pressure connection" or as a Piezometer (pronounced Peas-o'-me-ter).

It should be noted that the piezometer connection is always at right angles to the direction of flow of the air. If any air should impinge or strike the opening of the piezometer connection, then the static pressure reading would be affected by a velocity pressure. The Piezometer or static pressure connections should, therefore, be made in a straight portion of the duct where there is no possibility of the air striking the opening. The inner opening of the piezometer where it is attached to the duct should also be flush with the inner surface of the pipe and should not have protruding burrs sticking into the air stream. When properly made, the

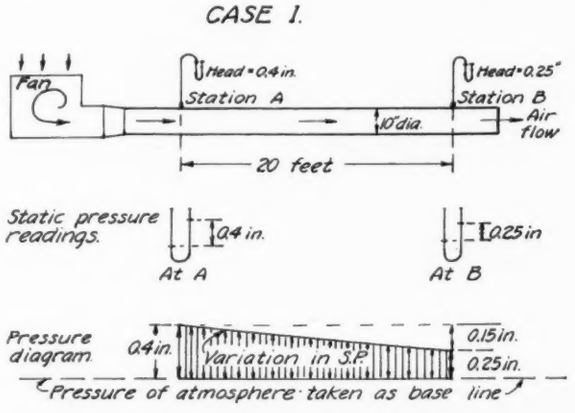



**Fig. 6—Line diagram showing static pressure measurements obtained in the case of a duct of uniform cross-sectional area. In this case the difference in static pressure represents the pressure loss due to frictional resistance of the duct to the air flow. Compare this case with the case shown in Fig. 7.**

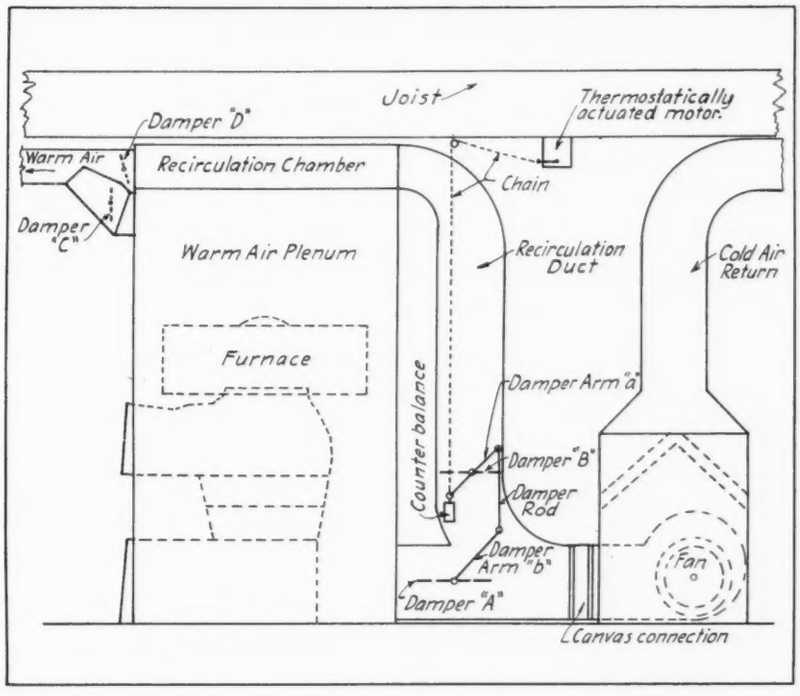
static pressure reading can be very easily obtained for any duct section. The information which is obtained by the measurement of the static pressure will prove of much value to the installer who is anxious to check up on the frictional resistance of the duct system.

### Information S. P. Reveals

Engineers refer to static pressure measurements as an index of frictional resistance. Static pressure is commonly regarded as the absolute measure of the frictional resistance imposed to the flow of air. But is this true?

*It is not always true that static pressure measurements will give the frictional resistance to the flow of air.* It is true only under certain conditions. For instance, suppose that we consider a duct section in-

(*Continued on page* 47)




# Fluctuating Dampers Between Blower and Furnace Suggested For Constant Circulation

By L. J. Russell
Oshkosh, Wis.

WITH the idea in mind of securing continuous blower operation and at the same time guarding against temperature overrun I am wondering if the system I show on the accompanying layout would solve the problem of unifying the ideal forced-air job and at the same time keep the cost of the job down to reasonable requirements.

I, myself, believe that this system would answer the practical purpose of supplying a low cost, positive, 24-hour day circulation and if properly balanced at all damper points, would keep as even a temperature at all hours as is humanly possible. This idea of placing the changeable dampers at the blower side of the installation instead of the warm side of the heater would cut out the elaborate control system necessary and as a consequence mean a simplified layout at a reasonable cost.

### Operation of System

The operation of the system suggested is as follows:

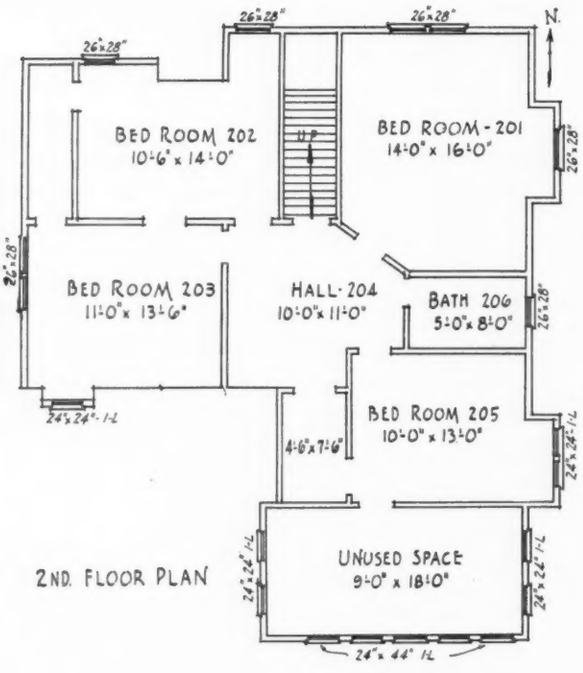
Each warm air is a combination of two branches from the heater—one from the warm air plenum and one from the recirculation chamber which are "teed" together. A quadrant damper is set in each branch; the one (Damper "C"), is set to pass the C.F.M. of warm air necessary to heat the room and the other (Damper "D") from the recirculation chamber is set at the proper angle to by-pass the correct amount of air to keep the temperature of the room from over-riding. Both these dampers once set in the proper position remain that way as the actual variations are registered through the thermostatically operated dampers "A" and "B."

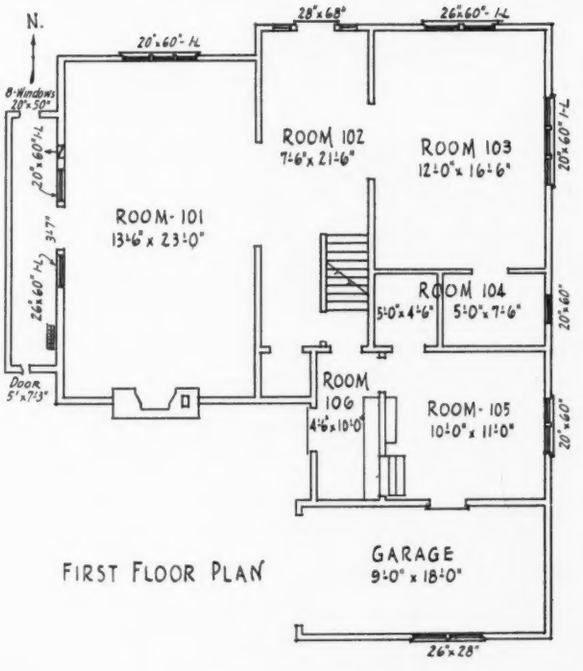
### Damper Influence

When the thermostat demands heat Damper "B" is entirely closed and damper "A" entirely open. When the thermostat is satisfied damper "B" is opened and damper "A" closes. The distance that "A" must close must be determined by experimentation and then can be regulated by the ratio of the length of arm "a" to arm "b." In this case I show arm "b" twice as long as arm "a" and through this difference damper "A" will only be three-quarters closed while damper "B" is completely open.

Thus with damper "A" partially open some air is by-passed through the heater to temper the cool air being forced to the rooms through the recirculation duct and chamber. This combination would keep the temperature of the rooms from overriding, from dropping too fast and at the same time a continuous circulation would always be in effect.

I believe that this system would give satisfactory results on either the trunk line or the individual pipe job. If any readers of AMERICAN ARTISAN have installed a system of this kind I would like to hear his views and experiences in this matter.




# Know How To Figure A Cold Water Cooling Job? Here's One Step By Step

DURING the past summer a deal of interest has been shown by contractors and home owners in cooling using well water or water from the municipal supply as the cooling medium. Believing that these installations using cold water involve questions which are interesting we publish here a discussion of the calculations involved in a typical such installation figured for northern Indiana. The steps followed to arrive at the final calculations were all taken from AMERICAN ARTISAN book "Practical Comfort Cooling," by Professor H. J. Macintire of the University of Illinois.

The two floor plans show the general arrangement of rooms, wall and glass areas, and the locations of the registers and returns of the existing forced warm air heating system.

### The General Problem

At the time the cooling installation was up for consideration the owner was adding a new breakfast room and second floor bedroom; also betterments in interior equipment. At the same time the cooling contractor was asked to submit figures to install a new square cased, forced air furnace with rectangular ducts, new blower, filters and controls. However, since no changes in register and return grille locations were contemplated we will assume that the air supply system remains as shown and that a fan capable of moving the air quantities needed for cooling was installed.

The first problem was to survey the house and get the owner to declare just what rooms he wished cooled. This was done, explaining how the elimination of cooling for the large sun porch would reduce materially the entire installation and apparatus required. As a result of this survey the calculations were made omitting the sun porch. This gives a cooling installation for three main rooms plus the hall, pantry and passageway on the first floor and four bedrooms, a hall, bath on the second floor.

The cooling medium used was well water from a deep well on the owner's property. It was determined by questions and some tests that the well would furnish an adequate supply of water and that the highest summer temperature of the water is 55 degrees. Using 55 degrees as the water temperature a data sheet was made up as shown. This data sheet varies somewhat from the sheet used for heating and is not as complicated nor elaborate as some of the sheets used in cooling. However, use during the past summers shows that it provides accurate data and sufficient margin of safety to account for some errors in assumptions.

### The Data Sheet

In the first double column of the data sheet the room names were placed with a designating number. In the second column the room areas and ceiling heights were filled in. In the third column the cubic feet of space by room was figured. The glass areas were then measured on the job, as the house is old and has some windows of unusual dimensions. The square feet of glass area was placed in column 4. The wall areas were then fig-

ured (including the glass); the glass areas from column 4 were then subtracted giving the net wall areas placed in column 5.

In cooling installations, floors and ceilings are highly important. Because the basement is not cooled and the temperature is an unknown quantity (and may be high if the owner leaves his basement windows open) each first floor room was figured for a temperature difference of 15 degrees for the floor. The area of these floors was filled in room by room in column 6. In column 6 we also show the areas for the ceiling of the second floor rooms. In the case of the ceiling, because there is an uninsulated attic, poorly ventilated, the heat gain for the ceiling was figured on the basis of a 25 degree temperature differential (not 15 degrees as in the case of the first floor). The ceiling areas were filled in in column 6. Column 7 contains the linear feet of crackage for doors and windows.

### The Heat Gain

In columns 8, 9, 10, 11 the heat gain for the particular construction of the walls, windows, floors and ceilings, plus infiltration were filled in. Note that the heat gain coefficients of transmission used in cooling are the same as the heat loss coefficients used in heating. The heat gain coefficients are—1.13 B.t.u. per hour per degree temperature difference per square foot of surface for glass; for walls, .25; for floor and ceiling, .33; and for cracks 1.2. This last figure, 1.2, means that to figure the heat gain due to infiltration we multiply 1.2 by the number of feet of cracks (44 in the case of the living room) times the temperature difference, in this case 10, to get a B.t.p. gain of 645. The temperature difference used throughout is 15 degrees.

In the last column the total heat gain for each room is obtained by adding up columns 8, 9, 10, 11 which gains are again totalled at the foot of column for the heat gain of the house.

### Dehumidification and Sun Effect

According to engineering data, cities in the general region of Indiana have a high relative humidity during the hottest weather, which necessitates reduction of humidity. Ordinarily this is accomplished by increasing the heat load total and providing enough cooling effect to condense moisture out of the air. In this particular problem this effect is secured by increasing the total heat gain 25 per cent as shown in the data sheet.

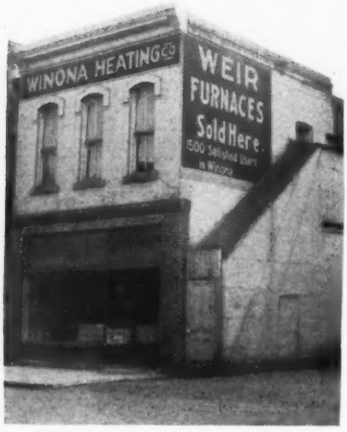
Also, in this data sheet no additional cooling load was estimated for those rooms which have east, south and west exposures, as the B.t.u. load was calculated room by room. At the end of the total heat load column, however, an additional load was added by including a 15 degree increase in load for bedrooms 203, 205, 201, bath 206 and the living, dining room, kitchen and pantry. As shown the total load then comes to just over 48,000 B.t.u.

With the data sheet filled in it was then necessary to calculate the amount of water required for cooling, the area of the coil needed, the amount of air to be handled by the fan. These figures follow:

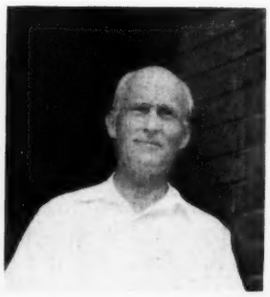
(*Continued on page* 46)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | B.t.u. Heat Gain | | | | |
| Floor | Room | Room Dimensions | Volume in Cu. Ft. | Glass Area Sq. Ft. | Net Wall Area | Ceiling and Floor Area | Linear Ft. Window Cracks | 1.13 Glass | .25 Walls | .33 Floor or Ceiling | 1.2 Cracks | TOTAL |
| 1st | Living No. 101 | 13′-6″ by 23′-0″ by 9′-3″ | 2,872 | 51 | 410 | 15° 310 | 44 | 870 | 1,530 | 1,545 | 792 | 4,367 |
| 1st | Hall No. 102 | 7′-6″ by 21′-16″ by 9′-3″ | 1,492 | 13 | 56 | 161 | 16 | 225 | 210 | 810 | 285 | 1,530 |
| 1st | Dining No. 103 | 12′-0″ by 16′-6″ by 9′-3″ | 1,832 | 47 | 259 | 198 | 39 | 795 | 975 | 990 | 702 | 3,462 |
| 1st | Pantry No. 104 | 5′-0″ by 12′-0″ by 9′-3″ | 555 | 8 | 38 | 60 | 13 | 135 | 150 | 300 | 234 | 819 |
| 1st | Kitchen No. 105 | 10′-0″ by 11′-0″ by 9′-3″ | 1,012 | 38 | 156 | 110 | 36 | 645 | 540 | 540 | 648 | 2,373 |
| 1st | Passage No. 106 | 4′-6″ by 10′-0″ by 9′-3″ | 416 | 21 | 44 | 45 | 20 | 360 | 165 | 225 | 360 | 1,110 |
| 2nd | Bed. No. 201 | 14′-0″ by 16′-0″ by 8′-6″ | 1,904 | 30 | 229 | 25° 236 | 45 | 510 | 885 | 0.21 1,250 | 810 | 3,455 |
| 2nd | Bed. No. 202 | 10′-6″ by 14′-0″ by 8′-6″ | 1,250 | 20 | 256 | 177 | 47 | 345 | 960 | 925 | 846 | 3,076 |
| 2nd | Bed. No. 203 | 11′-0″ by 13′-6″ by 8′-6″ | 1,262 | 24 | 201 | 149 | 39 | 405 | 750 | 775 | 702 | 2,632 |
| 2nd | Hall No. 204 | 10′-0″ by 11′-0″ by 8′-6″ | 1,028 | .. | 34 | 143 | .. | .. | 135 | 760 | .. | 895 |
| 2nd | Bed. No. 205 | 10′-0″ by 13′-0″ by 8′-6″ | 1,105 | 8 | 221 | 140 | 36 | 135 | 825 | 745 | 648 | 2,353 |
| 2nd | Bath No. 206 | 5′-0″ by 8′-0″ by 8′-6″ | 340 | 10 | 37 | 40 | 16 | 165 | 135 | 200 | 285 | 785 |
| | | | 14,068 | 270 | 1,941 | | | 4,590 | 7,260 | | | 27,227 B.t.u. |
| | | | | | | | Add for dehumidification load of infiltration 25% | | | | | 6,806 B.t.u. |
| | | | | | | | | | | | | 34,033 B.t.u. |
| | | | | | | | Add for sun effect on E, S and W walls and glass | | | | | 14,750 |
| | | | | | | | | | | | TOTAL COOLING LOAD | 48,783 |

Wm. A. Galewski



Stanley Duginski



H. W. Dunmore

# Contractor Capitalizes Cold Water Supply to Sell Summer Cooling

THERE are and there will continue to be success stories of contractors who have found by diligent application of modern merchandising methods a system of increasing their business and making for it a sound foundation. Such a firm is The Winona Heating and Ventilating Company of Winona, Minnesota; one of the most thoroughly air conditioned cities per capita in the country.

Wm. A. Galewski, President of the Winona Heating and Ventilating Company, founded his business a little over thirty years ago. His records show that he has to his credit over twenty-five hundred furnace installations. As further evidence of his careful management, he points with pride to some thirty-five mechanics employed at present in his establishment.

### Development of Business

Some two years ago he turned his attention and the attention of his organization to air conditioning as a new medium of profit.

Like many another contractor tackling a new line, Mr. Galewski was faced with the problem of how to develop business. It wasn't long before he

Air-Conditioning
COSTS LESS
IN
WINONA - - -
WATER CONDITIONS HERE ARE SUCH THAT YOU CAN HAVE COMPLETE AIR CONDITIONING FOR YOUR RESIDENCE, STORE, OFFICE, OR INDUSTRIAL BUILDING AT A FAR LOWER COST THAN IS POSSIBLE IN MOST OTHER LOCALITIES
There is an abundance of cold water at a reasonable cost and water is one of the finest cooling mediums to be had. It not only cuts down original air conditioning equipment cost and makes installations much more simple, but it also allows you to operate your cooling system at the minimum expense.
The Winona Heating and Ventilating Company has installed many air conditioning systems in Winona using water as a cooling medium. We should like to tell you the story of these installations and show you that you can enjoy the benefits air conditioning will bring at a cost far lower than you probably estimate. It costs you nothing to get complete information on TRANE air conditioning equipment. Why not see us at once before hot weather is on us.
Winona Heating & Ventilating Co.
H. W. DUNMORE—WM. GALEWSKI
112 Lafayette St.
Phone 2064

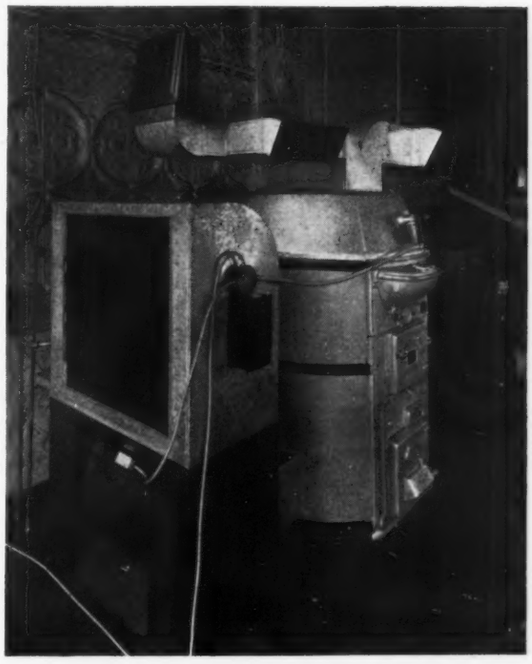
Two typical newspaper advertisements. One carries out a campaign to publicize Winona's cold water. The other seeks to advertise the rapidly increasing number of cooling installations.

WE POINT TO THREE MORE AIR CONDITIONING INSTALLATIONS
In the past few weeks three more business establishments have installed Trane Air conditioning systems. The business man who wishes to increase his summer business, should investigate. It makes the cash register jingle on hot days.
★ HOF BRAU
176 West Third St.
★ HOT FISH SHOP
Near Sugar Loaf—On Mankato Ave.
★ THE STEAK SHOP
125 Main Street
Winona Heating & Ventilating Co.
113 Lafayette St.
Phone 2064
H. W. DUNMORE—WM. GALEWSKI

Don't SUFFER
from HAYFEVER
ON every front the attacks of dusts, pollen, overheated, humid and germ-filled air are turned back in utter defeat! That's the report when a home is air-conditioned. Let us tell you how little one unit or complete air conditioning will cost for your home, office, or shop!
Let Us Show You a Trane Air Conditioning Unit in Operation.
Winona Heating & Ventilating Co.
112 Lafayette St.
Phone 2064
H. W. DUNMORE—WM. GALEWSKI

Left—Another advertisement; this one laying emphasis on hay fever and the ease with which relief may be secured through cooling and filtering at nominal cost

Right — View of one corner of the Winona Heating Company's show room where a complete and running air conditioning system is used to demonstrate the comfort, health, economy of the particular system advocated.



discovered that the Winona water supply is of such nature that water as a cooling medium can be used very successfully and at slightly lower cost than any other refrigerant. As a result he immediately specialized in water cooling equipment and systems. This gave him the inside track on price arguments without any necessity of price cutting. His next problem was to find apparatus and assistance to sell and engineer water cooling installations. Then he secured a salesman to get out and develop business. Because he does not operate outside of Winona, he had to secure a man who could sell enough in a city of twenty thousand to make the whole set-up profitable. Such a man he found in Stanley Duginski, who has been with him ever since.

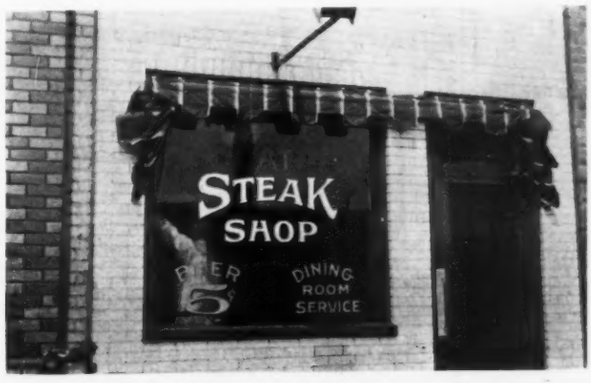
### Selective Canvass

Salesman Duginski, after completely acquainting himself with the various problems and pieces of equipment (he is not an engineer), immediately made a study of all furnace installations and from their records he selected those prospects whom he felt were qualified financially and otherwise to become interested in air conditioning. These prospects were divided into two major classes—domestic and commercial. It seemed that the commercial prospects offered the best chances of development; consequently they were contacted first. This system is still in use to the extent that of every hundred calls made, practically 66 of them are upon stores, offices, shops, and other commercial institutions.

Calling upon this list the first time, only one thing was undertaken—an attempt to arouse the prospect's curiosity. In other words, make the

(*Continued on page* 44)

A typical residence in which a summer-winter conditioning plant was installed




A commercial installation where summer cooling was provided by means of a suspended water coil and blower.

# Automatic Control For Cooling Systems

## [Water Cooling, Part 3]

**In connection with control selection the contractor must also decide whether to—recirculate the full capacity of the fan; take in outside air; if so how much; by-pass part of the house air around the coil; how much air shall we move. These are not strictly problems of control, but as we have pointed out are a part of the problem of operation.**

PROBABLY as important a question as any will be—"How much of the house shall we cool?"

The contractor should be in a position to give some figures for guidance of the customer. Roughly speaking, cost of equipment is practically proportional to amount of space cooled—in domestic installations. If the owner wants to cool six rooms (three up and three down) the cost will be about twice that for the three rooms downstairs.

Operating costs are not as directly proportional to space cooled, but are close enough so that for survey cost proposals cost by proportional space can be used.

At the present time zone installations are popular. The area to be cooled is divided into zones according to "time of occupancy"—in other words, rooms used during the daytime are grouped in one zone; rooms used at night are grouped in another zone. The idea is that the apparatus can be sized just large enough to comfort cool one zone—not all zones. The owner must cooperate by accepting the fact he cannot cool all zones to as low a temperature as he can cool one zone and that it will be up to him to change over the system for one zone to another as he uses his house.

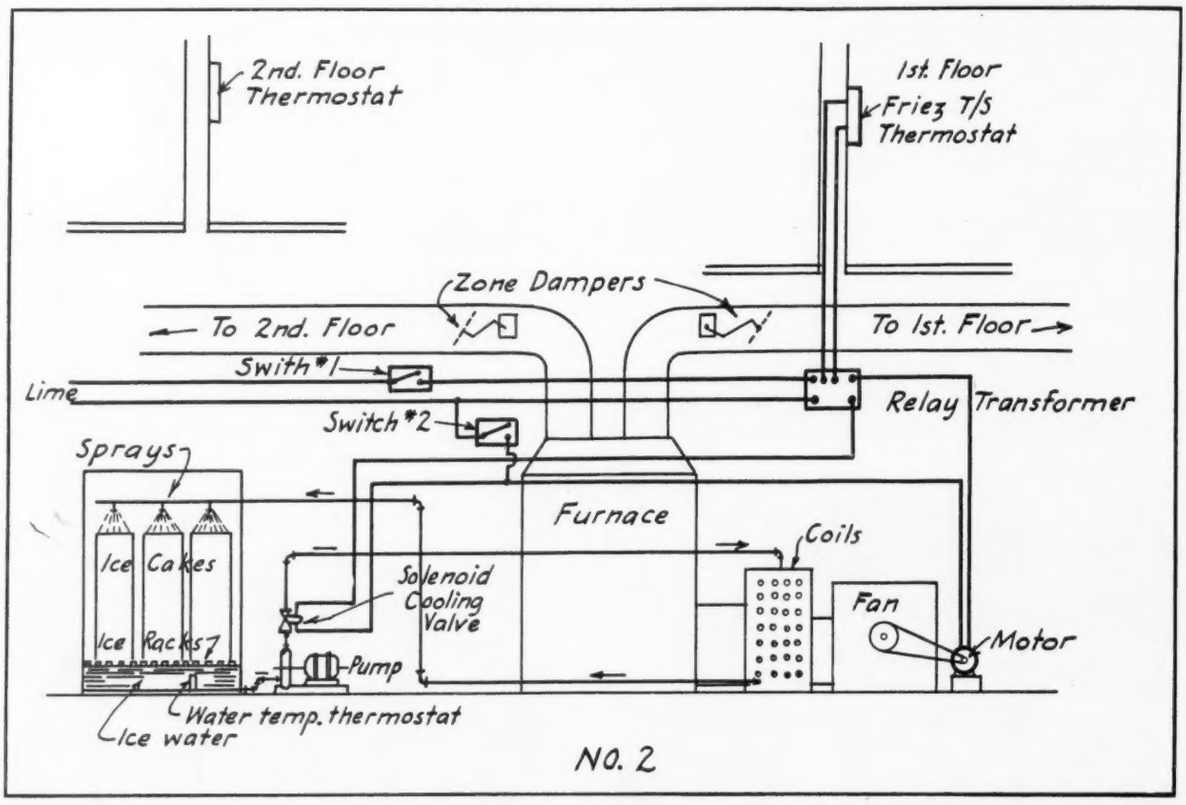
The control apparatus used for zone cooling has already been discussed. Also, a very comprehensive article covering this point will be published shortly.

Some other technical problems which the contractor must solve cover the following:

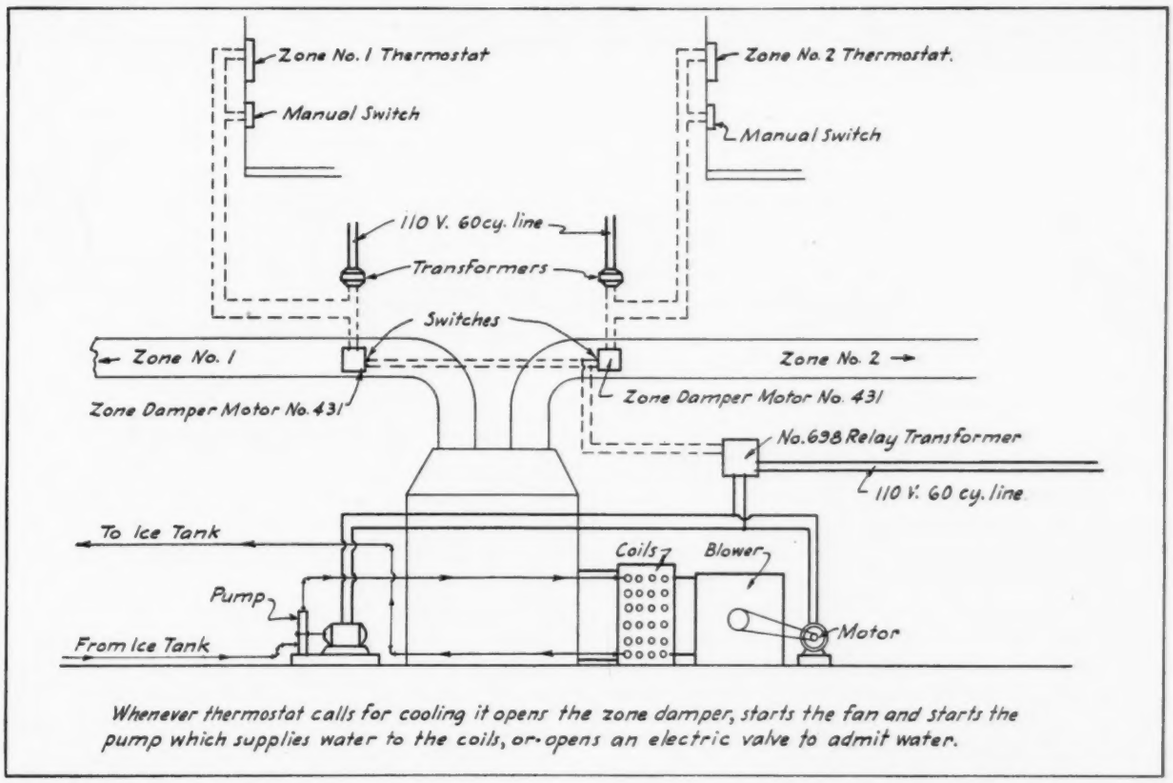
1—Shall the full capacity of the fan be recirculated? 2—Shall we take into the fan some outside air and if so how much? 3—Shall part of the air from inside the house be by-passed around the coil while all the air from outside be passed through the coil?

The answers to these questions require some short explanation of both the principle involved and of the so-called "auditorium patents."

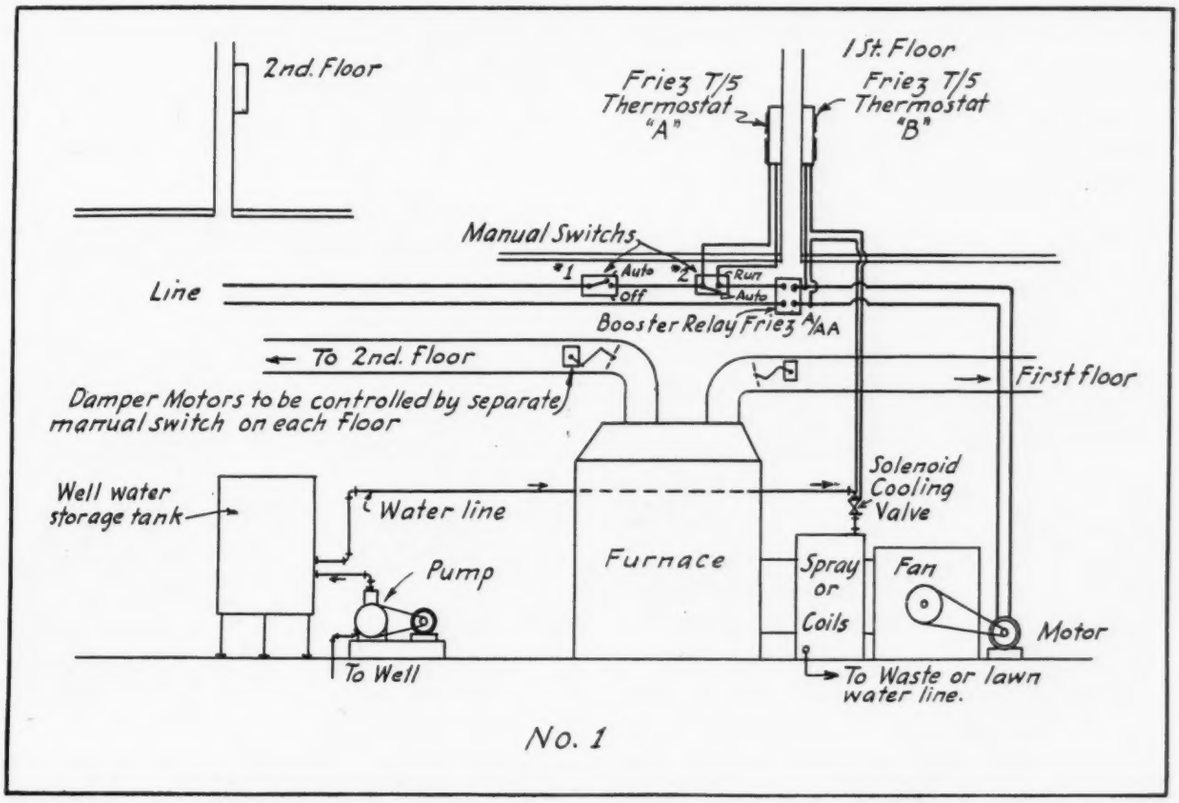
(*Text continued on page* 43)




**The wiring diagram shows instruments so arranged that opening switch 1 shuts down the entire system; leaving switch 1 closed permits the plant to operate.. Closing switch 2 runs the fan regardless of the thermostat. With switch 2 left open operation is entirely automatic and whenever the thermostat calls for cooling the fan runs and the water pump operates.**


Zone No. 1 Thermostat
Manual Switch
Zone No. 2 Thermostat.
Manual Switch
110 V. 60cy. line
Transformers
Switches
Zone No. 1
Zone No. 2
Zone Damper Motor No. 431
Zone Damper Motor No. 431
No. 638 Relay Transformer
110 V. 60 cy. line
To Ice Tank
Coils
Blower
Pump
From Ice Tank
Motor
Whenever thermostat calls for cooling it opens the zone damper, starts the fan and starts the pump which supplies water to the coils, or opens an electric valve to admit water.

**This wiring diagram for Detroit Lubricator Company instruments shows a system so arranged that whenever either zone damper opens the fan runs. The water pump runs in the same cycles as the fan. A manual switch permits cutting out either thermostat should only a part of the house be cooled. An outdoor-indoor thermostat can be employed to maintain a constant temperature differential if desirable.**




**In this diagram showing instruments by Julien P. Friez & Sons Co., the damper motors are controlled by a manual switch. When first floor damper is opened, second floor is closed and vice versa. With manual switch 1 in "off" position all operation is shut down. When both switches 1 and 2 are in "automatic" position the thermostats control all operation. With thermostat "A" set at 75 degrees and "B" at 80 degrees the fan starts whenever temperatures exceed 75 degrees. Should temperatures continue to rise the water pump cuts in when thermostat "B" reaches 80 degrees. Just the reverse operation on downward cycle. With switch 1 in "automatic" and switch 2 in "run" position the fan runs continuously while water pump starts when thermostat "B" reaches 80 degrees.**

# What Is This Night Air Cooling?

## [Part 3]

**One of the problems of night air cooling is where to place the fan in the attic—outside window, stair head door, air tight room? This article discusses the good and bad features of each location. We also take up noise—highly important. And use of the basement fan—what it can do, some of its limitations.**

IN the June and July issues we determined our fan size, our amount of air to be handled, got our registers located and sized and the next problem is how to mount the fan and where.

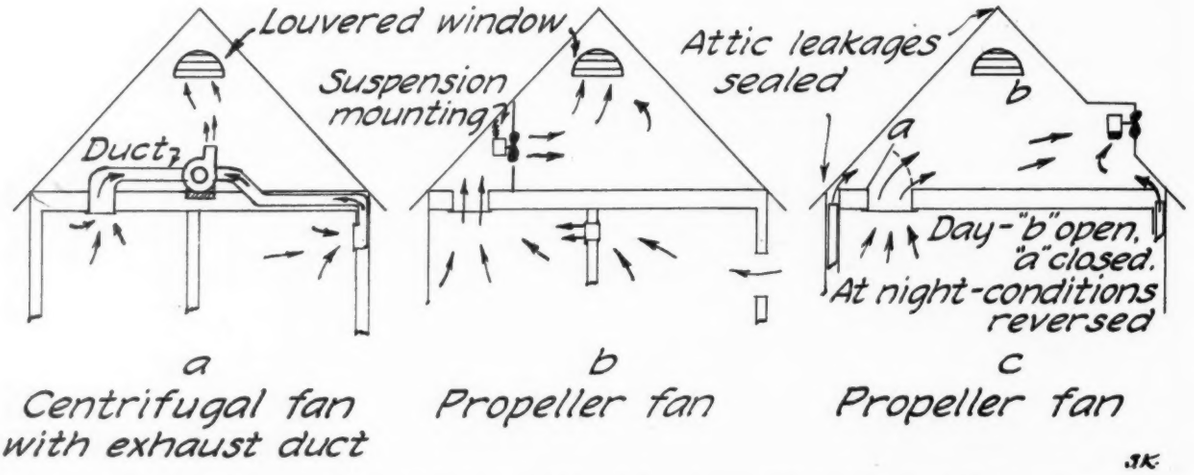
Previous mention has been made of two types of fan—the propeller and blower types. We have also mentioned placing the fan at the head of the attic stairs, in the middle of the attic or at the windows. Let us consider an attic stair location. Some attic stairs end in an upright door opening into an attic hall or into the attic space. Where such a door or stairs exists a propeller type fan can be mounted on the attic side of the door. The fan draws the air up the stairs and builds up a pressure in the attic. This air under pressure escapes from the attic windows or louvers. If there is only one window we may have trouble when the wind is blowing against this window. If there are windows on all sides or two sides the air will escape with the wind. This point should be kept in mind.

Attic stairs opening without a door may be handled by installing a trap door which lays down. The fan may be mounted on this trap door, but this practice may present a difficulty, as the weight of the fan will make the door hard to lift up if the door is used frequently.

For such a situation the fan can be placed to better advantage at an outside window or a small room can be built around the stair opening and the fan mounted to pull through a hole cut in one wall of the room. Such a room must have a door into the attic and of course such a door will have to be air tight and kept closed.

Mounting the fan at an outside window or louvered opening was probably the first type of installation. The chief difficulty is that some fans will not work well when a brisk wind is blowing against them. The installer must select a fan which will blow air out against the average wind pressure. When fans are thus mounted the fan not only pulls air up through the stairway or register but also exhausts the air from the attic space. Some means must be devised to eliminate the fan from getting all its air from the attic and none from downstairs. One way is to seal all openings into the attic except the stairs or registers. This means that not only must all windows be sealed, but all openings to the outside along the roof eave must be blocked off. Many cases exist where failure to block up these eave openings has resulted in the fan exhausting only attic air.

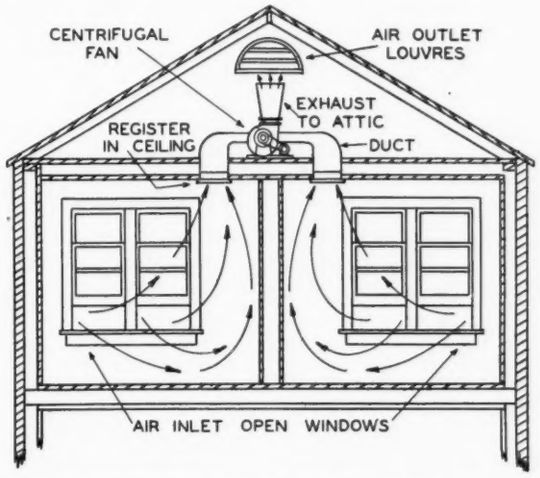
All types of fans can be directly connected to the ceiling registers by ducts. Some fans have specially built housings which come with the fan. Others require fabrication of a housing. In this connection it




**This composite sketch shows a fan located at an outside window, in a partition at the head of the stairs, on main grille and directly connected to the grilles by ducts. In "A" the fan discharges directly into the attic, letting the air escape as it will. In "B" the fan room is sealed from the attic, but discharges into the attic as in "A." In "C" the fan blows directly out-of-doors, and must work against any existing wind pressure.**

has been found advantageous to make some provision for exhausting attic air—otherwise the attic may heat up to well over 100 degrees on a hot day and the attic air act as a huge radiator which tends to increase downstairs temperatures.

In some cases a stub duct is opened to the attic and proportioned to take in a certain percentage of the air pulled by the fan. In other cases a swinging door is



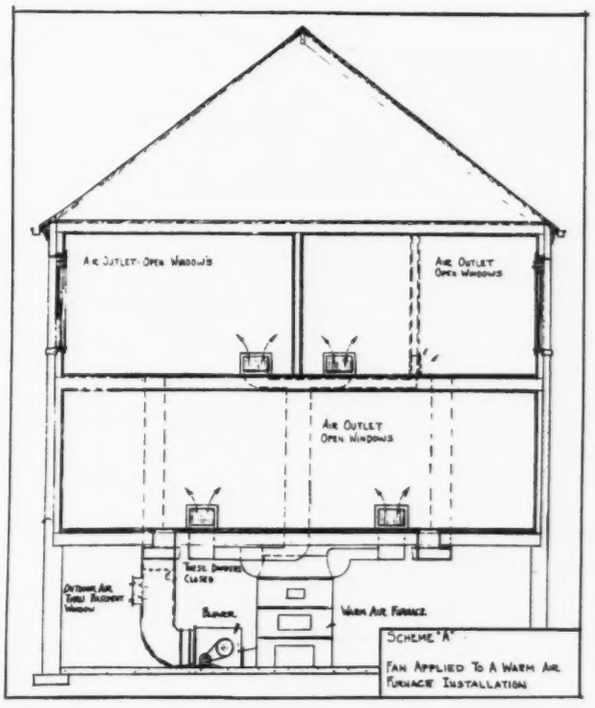

**Where fans connect directly to the registers by ducts the fan must be mounted on pads and the ducts must be broken by canvas. These installations are especially subject to noise.**

provided so that the fan can be used for all attic air, all downstairs air or a percentage of both.

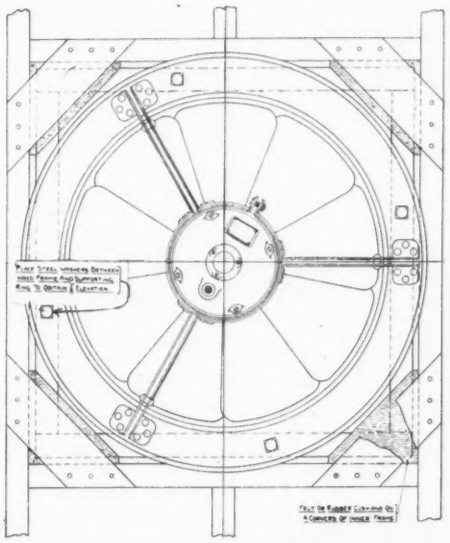
Generally speaking however, exhausting the fan's air into the attic and thereby building up a pressure which escapes with the wind, eliminates the problem of proportioning the air from both floors.

Our last problem is noise. The structural framing of the average house is none too vibrationless in the attic space. A fan which vibrates can set up a noise which condemns the whole system because the fan runs directly over the sleeping rooms and at night. Therefore every precaution must be taken to eliminate noise. Fans which run at high speed generally are more noisy than fans which run at slower speeds. Therefore if the volume of air to be handled falls right on the line between two fan sizes the contractor should recommend the larger slower running fan.

At the present time fans are mounted in these ways: 1—on the attic floor joists. This requires a silent, vibrationless fan and suitable rubber pads under all feet or legs or under the bottom of the housing. Such pads may be continuous in the form of a sheet, or in the form of strips or pads, depending on the construction of the housing. If ducts are used each duct should be broken close up to the fan or blower cabinet and a canvas insert placed as a section or collar. Fans mounted in attic windows or in upright


Air Outlet-Open Windows
Air Outlet Open Windows
Air Outlet Open Windows
Warm Air Furnace
Scheme "A"
Fan Applied To A Warm Air Furnace Installation

**Basement fans are intended to build up a pressure indoors which forces hot air out through the windows. Also, heating system fans must be greatly speeded up for increased circulation. Here is a typical system.**



**Propellor fans mounted on outside walls or in partitions may be silenced by using rubber pads as shown here.**

doors or walls are more difficult to cushion and better success in noise elimination will probably be obtained by selecting a larger, slower operating unit than by trying to dampen the vibration of a fast running unit.

A controversial subject this year is—which is best—a fan placed in the attic or the use of a basement blower? Both schemes have their advocates and advantages can be claimed for both systems. The chief claim made by the basement blower folks is the ability to filter air. They say that any system which pulls in large quantities of air through open windows also brings along large quantities of dirt and dust. The advantages, problems and a discussion of basement blower ventilating systems will be presented in another article.

# Insulation For House Construction*

By J. D. Hoffman
Professor of Practical Mechanics
Purdue University

[Part 4]

**In the last article of this series (July) we presented a picture of the heat loss occasioned by poorly fitting windows. This article shows the extent of this loss and gives the basic formulas from which wall heat losses are calculated. The article also discusses different types of windows and their loss.**

WHILE on the subject of the window, something should be said about the casement window. Speaking generally, the casement window creates a great deal of mischief for the heating man. The average carpenter is not able or chooses not to fit the casement window so as to avoid heavy air inleakage. These windows usually leak like sieves and provide wonderful opportunities for the weather strip man to get in his good work. Workmanship and good sense at this point are very valuable.

Home owners, except in the northern sections of the country, have concerned themselves very little with window efficiencies. Much of this heat loss is taken for granted as something that cannot be avoided. Its effect upon the successful operation of the heating system, however, is worth considering. Especially is this true of the gravity warm air heating system, where excessive inleakage at the windows may create an air pressure within the room sufficient to reduce the velocity-pressure of the incoming warm air from the furnace to the room materially, sometimes even counteracting it entirely and reversing the current. Under such conditions the room on the windward side of the house will receive deficient heat and the room on the lea side will be overheated. Inleakage interferes with the satisfactory heating of any room by any heating system. It also costs money. It should be remembered that every cubic foot of outside air entering the room on a cold day, if not heated to the room temperature before entering the room, will tend to cool the room air below the comfort zone and the heating system will be said to have failed.

### Thermal Effect Example

To illustrate, the thermal effect, say, in a room 14 ft. x 21 ft. x 10 ft., having a total window perimeter of 100 lineal feet, with an outside air velocity of 15 miles per hour on a zero day may be estimated.

Assuming inleakage through one half the total crackage (50 lineal feet) at the rate of 125 cubic feet of air per lineal foot per hour (⅛-inch crack, 15 mile wind) gives a total of 6,250 cubic feet per hour. This is equivalent to 2.1 room volumes.

Now, if the outside air is 0° F. and the room air is maintained at 70° F., each cubic foot of air would be raised through seventy degrees and would require an expenditure of 1.27 x 6250 = 7937.5 B. t. u. per hour. With coal costing $8.75 per ton of 2,000 pounds, and having a heating value of 12,500 B. t. u. per pound and a combustion efficiency of 60 per cent, the expense of heating this inleakage air for a 24-hour day would be (7937.5 x 24) ÷ (7500 x 2000) x 8.75 = 11.1 cents.

### Determining Heat Losses

Heat losses may be obtained by experimentation or by calculation. For simple structural materials, i. e., single thicknesses of any one material, the losses are usually determined by experimentation; but for various materials built as a unit into a wall, ceiling, etc., because of the almost inexhaustible number of possible combinations, they are usually calculated.

The simplest form of the equation for this work is:

$$H = K A (t - t_o) \qquad (1)$$

where H = the total heat transmitted in B. t. u. per hour for the given surface area, between the limits of temperatures given; K = coefficient (rate) of heat transmission per hour per square foot of surface area of the wall, ceiling, etc., where $t - t_0 = 1$; A = exposed surface area involved; t = temperature on warmer side of wall; and $t_0$ = temperature on cooler side of wall.

In this equation K is the all-important uncertainty. How may it be determined by calculation? The equation commonly used for this purpose is

$$K = \frac{1}{\frac{1}{k} + \frac{1}{k_o} + \frac{a_1}{k_1} + \frac{a_2}{k_2} + \text{etc.}} \qquad (2)$$

where k and $k_0$ are coefficients, respectively, of the air film on the warmer and cooler sides of the wall or ceiling; $k_1$ and $k_2$ are coefficients, respectively, of the materials, which make up the wall or ceiling; and $a_1$ and $a_2$ are the thicknesses in inches, respectively, of the same materials.

For illustration, what is the value for K for the standard framed wall (Fig. 1, May). Substituting, k = 1.34 (for so-called still air, determined by experiment); $k_0$ = 4.02 (for outside air, moving at about 15 miles per hour, determined by experiment);

$$\frac{a_1}{k_1} = \frac{1}{2}$$

(by experiment), for ordinary lath and plaster; $k_2$ =

(*Continued on page* 42)

*Reprint of Extension Series No. 31, Engineering Extension Department, Purdue University.

# We Applied TRANE'S Air Conditioning Dealer Formula to sell 31 jobs

--says Mr. Galewski, Jr. of the Winona Heating & Ventilating Company of Winona, Minnesota. And Mr. Galewski will tell you in addition that anyone who wants to make a success of the Air Conditioning business can do so with the same formula. Half the battle is the equipment you sell. It must be right--on every job--right and priced for a profit. Get into the money-making swing. Hundreds of dealers all over the country are making more money than ever before. Get your share!

Stanley Duginski, former football coach, now sales manager for the Winona Heating & Ventilating Company has exploded the theory that engineering training is necessary to be successful in air conditioning sales work. He has had no engineering experience whatsoever, yet he is hitting the line hard with TRANE sales help and putting over one scoring order after another.

NOW *IS THE TIME TO LAY YOUR PLANS FOR 1936 AIR CONDITIONING SEASON---IF YOU WANT TO SELL AIR CONDITIONING GET THE DATA ON THE FORMULA FROM TRANE*

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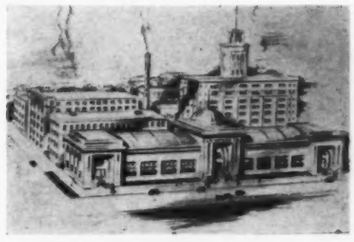

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**This new complete Compact Assembly offers a unit ready for immediate use with the minimum requirement of installation work. It is furnished complete with fan, filters, motor and drive; all factory adjusted and requiring only a connection to the furnace and to the cold air return.**

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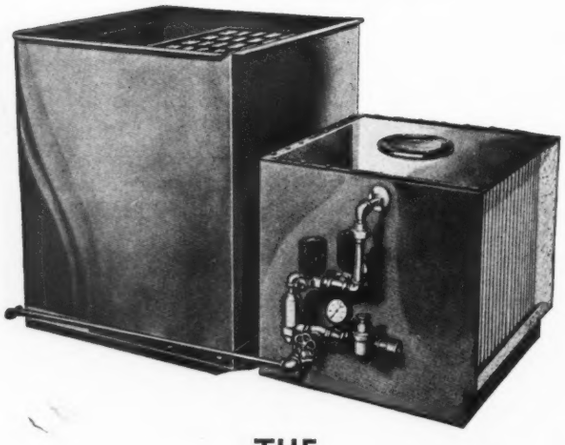

THE

BISHOP & BABCOCK SALES CO.

CLEVELAND OHIO


# Hoffman Insulation

(*Continued from page* 40)

1 (by experiment), for wood; and $a_2 = 1.4$ (thickness of sheathing and siding, paper being considered only as good measure), we have

$$K = \frac{1}{\frac{3^*}{1.34} + \frac{1}{4.02} + \frac{1}{2} + \frac{1.4}{1}} = .228, \text{ say } .23$$

If this were a brick veneer wall with the ½-inch space between the bricks and the sheathing filled with cement mortar, in which the conductivities $k_3$ for brick = 5, and $k_4$ for cement mortar = 8, we have

$$K = \frac{1}{\frac{3}{1.34} + \frac{1}{4.02} + \frac{1}{2} + \frac{.8}{1} + \frac{.5}{8} + \frac{4}{5}} = .19$$

In this way heat loss values have been computed for many types of wall and floor-ceiling constructions. A few of the most commonly used wall types are:

| WALL TYPE | K |
|---|---|
| 1. Standard frame wall | .23 |
| 2. Standard framed wall, except with the substitution of ½-inch fiber board for the lath as a plaster base | 0.18 |
| 3. Standard framed wall, except with the addition of ½-inch felt or quilt insulation between studs | 0.13 |
| 4. Standard framed wall, except with the stud space (3⅝-inch) filled with fibrous stone filler, in bulk | 0.09 |
| 5. Solid brick (13-inch), furred and plastered | 0.18 |
| 6. Brick veneer on 6-inch hollow tile, furred and plastered | 0.17 |
| 7. Brick veneer substituted for the lap siding in the standard framed wall, and cement filler between brick and sheathing | 0.19 |
| 8. Stucco substituted for lap siding in the standard framed wall | 0.26 |
| 9. Stone (solid) 13-inch, furred and plastered | 0.24 |
| 10. Concrete (solid) 9-inch, furred and plastered | 0.25 |

From the values just quoted, the standard framed wall (not quite 6 inches thick) as an insulator, is slightly better than the 13-inch furred and plaster stone wall, or the 9-inch furred and plastered concrete wall, but is not quite as good as a 13-inch furred and plastered brick wall. It is better also than the stucco-and-frame and not as good as the brick veneer-and-frame wall.

It is easy to see that the insulation idea applies especially to the framed wall, and since houses of this type are more numerous than any other, this discussion refers especially to the framed wall type.

*The two surfaces next to the stud space are taken as the same as still air.

# Controls For Cooling

(*Continued from page 36*)

In the early days of cooling the industry used tremendously large machines which could not readily be stopped and started. Since running the machines and fans at normal speed resulted in too cold a condition, a scheme was devised whereby all the outside air and a proportioned amount of recirculated air passed through the cooling chamber while the remainder was untreated and was remixed to raise the temperature of the air entering the space to be cooled.

The so-called "auditorium patents" are based on this scheme and any system automatically controlled using this method infringes. However, with the small machines used in domestic installations, stopping and starting the compressor or the cold water pump is no trick at all so why bypass? Whether our fan runs intermittently or constantly makes little difference. We can put all the air through the coil or washer without by-passing and seldom if ever cause such a cold draft that the owner complains. Most people do not object to a cold breath of air on very hot days when the system would be operating constantly.

### Too Cold Register Air

As a matter of fact the problem of too cold air from the registers is more a matter of diffusion than of by-passing air around the coil. If we remember our heating knowledge that high velocity air is rapidly diffused within a few inches of the register where high side wall or diffuser blade registers are used we can easily see how we can blow cold air without causing drafts.

Some argument has arisen on the question of bringing in outside air in the domestic cooling installation. The only advantage of an outside air intake is that by manually throwing a damper we can use the outside air for night air cooling. During hot days when we want to cool, 100 per cent recirculation with no outside air makes the simplest installation.

If we are still afraid of too cold air and want to install a more elaborate system we can divide the coil into two or three sections. The fan should run all the time or at least whenever the inside temperature exceeds a certain setting. As long as the fan runs water and air should be circulated through the first section of coil. When the thermostat setting is reached the second coil section is opened to water. A few degrees higher the last section is thrown in. Or we can use an outside-inside thermostat which opens more sections as the outside air temperature gets higher and higher. These more elaborate systems require more explanation than we can give in this short review, but anyone interested can get full details by writing us.

### How Much Air?

The last question to be answered is—"How much air shall we move?"

The usual heating system is based upon from four to six air changes per hour. Probably one or two more air changes should be adopted for summer cooling

(*Continued on page 52*)

WHAT'S THE DIFFERENCE
BETWEEN A GOOD WARM-AIR FURNACE
AND A POOR ONE?

Right! Humidity. Moisture that can be picked up by the warmed air constantly and without fail. That's where the ordinary hand-filled water-pan falls down—it isn't forget-proof.

The answer is automatic filling of the pan—which means an M-VB Humidifier Valve. Fool-proof, forget-proof, absolutely automatic in its action. Made in four numbers—one will fit any pan, any desired position.

Installation is simple—without dropping the fire. A couple of holes, an adjustment, and the job is done. Action is entirely automatic, maintaining the correct water level at all times without attention. Famous M-VB construction guarantees long life with the best of service.

M-VB Humidifier Valves come for installation through top or side of pan. With float position set or adjustable. Minimum efficient working space—12" by 4". In all types, moving parts are clear of the water, can't corrode or stick. Valve-plunger is chromium-plated, seating against a special washer that resists heat and live steam.

A neat box contains all fittings for a complete installation, with full instructions. They include: (1) the valve—any type; (2) complete strap-valve assembly to fit ⅜", ½", or ¾" IP size pipe, (3) 10 ft. of ¼"—20 ga. soft copper tubing; (4) copper float.

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SCOVILL MANUFACTURING COMPANY
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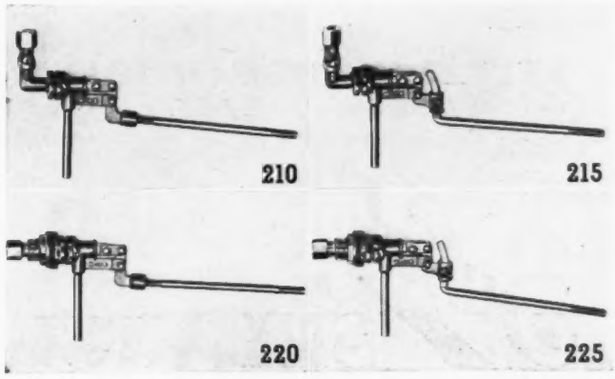
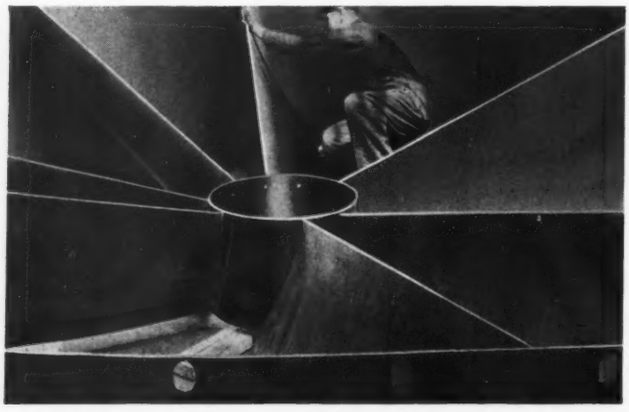
*A COMPLETE LINE OF CLOSET TANK FITTINGS*



# You may never



have occasion to install a ventilating fan with an inlet cone as large as the one the man above is working on—a fan which has a wheel over twenty feet in diameter,—the largest steel-plate mine fan that we know anything about.

# You may not care

whether this man is testing a fan for ventilating work, or for an airplane wind-tunnel, or for a power plant in Mexico.

# but—

if you buy and install fans for *any* kind of service—you'll want to know that Buffalo engineers can help you select the right fan for that service—that the fan they recommend will do the job—and you'll have no complaints from the customer.

Worth something to be sure of that, isn't it? Let us work with you.

**BUFFALO FORGE COMPANY**
497 Broadway, Buffalo, N. Y.
In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo" fans for every SERVICE


## Winona Cooling Jobs

(*Continued from page* 35)

prospect air conditioning conscious. The salesman had to be exceedingly careful on this point—to proceed too fast was dangerous. So he led the conversation into a discussion of the existing hot spell. Then he tactfully asked if the prospect had ever considered doing anything about it. Always the answer gave him the lead upon which to base his talk. If it was in the affirmative, he had only to direct the conversation into ways and means. If it was negative, he tried to show in as simple a manner as possible what other similar places of business were accomplishing. In either case he did not make the interview too long. When some time later he made his second call, sales resistance was considerably lowered.

### Using the Showroom

Usually Salesman Duginski found it easy to entice the prospect into visiting the showroom for an actual demonstration. The showroom and the equipment is not elaborate, but it is neat and clean and the complete air conditioning system which has been installed is always in the finest working order. The demonstration is one of the keys to the successful closing of the sale. The prospect usually has numerous questions and Mr. Duginski has found simple, straightforward answers to these questions.

So the prospect is led up to the point where he will allow a survey to be made. Up to this time there has been no mention of price. Any query regarding costs is usually answered by the statement that at this particular stage it is almost impossible to give an estimate and that statistics show that of every hundred people asked about the cost of air conditioning, almost eighty per cent overestimate the cost. This leaves the prospect with the idea that the imaginary amount he has fixed in his mind is probably high so that he feels he will be wiser to await the results of the survey and engineering analysis before coming to any conclusion.

### Engineering

Either complete details of the job are sent to the manufacturer for analysis and recommendations or the factory representative is requested to call and go over the whole job. A job is never figured and carried out within the organization alone, even though it is possible to do so. The manufacturers-contractors check and double check system assures customer satisfaction.

With the building surveyed, the system laid out, and the cost figured, everything is ready for the final call, but when the interview does come about, still nothing is said about price. The prospect is first led through the explanation of the system and its advantages. As his enthusiasm rises, he is **sold** more and more on the advantages of such a system for his building. Then and only then is he allowed to enter into a discussion of costs and it

has been learned that he will be much more tolerant of facts and figures at this stage than at any other.

For residential air conditioning much the same procedure is followed with the exception that it is the woman who receives most of the attention. The man's attitude in most cases is that the woman is the one to be satisfied inasmuch as she is the one who spends most of her time in the dwelling.

### Comfort, Health, Prestige

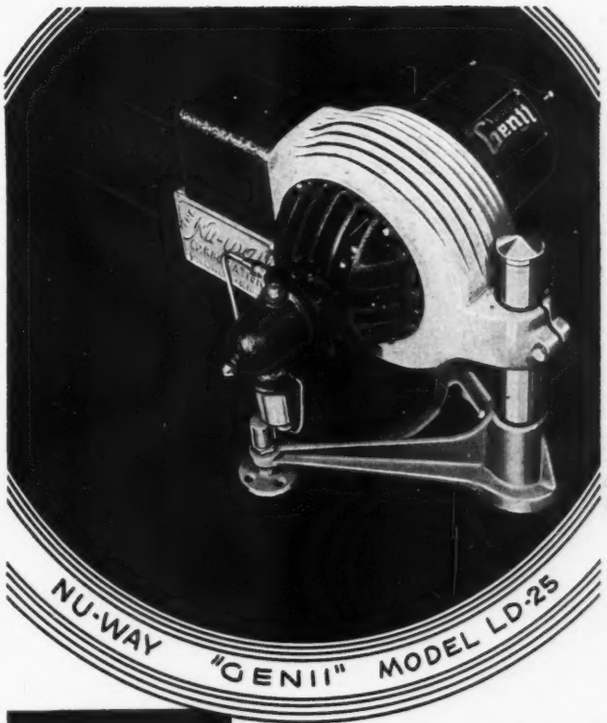
The woman is made to see three major advantages air conditioning will bring to her home. The first of these is comfort. The sweltering heat of cooking in a hot kitchen is recalled to her mind. Sleepless nights too are mentioned as is the house work caused by dust and dirt from open windows. In contrast to this, a verbal picture is painted of a house beautiful, cool and comfortable with fresh, dehumidified air. A house that is clean and crisp, with furniture and decorations protected from grime because the air is filtered and purified.

Next, stress is placed upon health. If there are children, their health protection is made a major theme. Statistics are shown proving that occupants in air conditioned buildings are less subject to colds, coughs, and other minor respiratory illnesses than are occupants in buildings with no air conditioning. If there are any indications of a hay fever condition, it is shown how doctors are availing themselves of air conditioned rooms for the alleviation of this condition. Even the value of sound, restful sleep is shown in its relationship to healthy bodies and nerves.

The step which follows, of course, is to arrange for a demonstration at the showroom. There, on a hot day or evening, most of the remaining sales resistance is broken down. No one can stand in a room at 75 or 80° while outside the temperature is 100°, without wishing he could live in such conditions. But the conversation is always kept free of cost discussions.

The company has always been a consistent advertiser in the local newspaper. Space of varying size is utilized and the copy is mostly of the institutional and "reason why" type. It plays up the jobs which have been installed and the reasons why air conditioning should be in every home and building. No attempt is made to trace returns from this advertising—Mr. Galewski believing that to have the firm name and air conditioning constantly before the public is enough.

The only other form of advertising used is the showroom. The establishment is not particularly well located, that is, it is off the busiest street. A large thermometer has been hung in the window showing the temperature inside which is, of course, considerably lower than that outside in the summertime. Very few people are pulled in off the street, but this does occasionally happen. The greatest percentage of prospects are developed through the selective canvass.

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**Easy to install. Controls combustion chamber and water storage tank all assembled at factory. Efficiency 50% to 70% saving over gas in most communities. Burns Number 1, 2, or 3 Fuel Oil. A quality product with many outstanding sales features.**

# *Modern Design*

**The buyer of an oil burner in the fall of 1935 will be a discriminating fellow.**

**He will insist on efficiency; He will insist on economy; He will insist on quietness; He will insist on a reputation of the manufacturer; He will insist on a MODERN DESIGN.**

**To the dealer of automatic heat the Nu-Way "Genii" Model LD-25 will fulfill all of these requirements.**

**Send for our new 1935 catalog and check over the new Nu-Way Model LD-25. Notice its simplicity of installation. Notice its self-priming pump which eliminates so many service calls. Nu-Way is one of America's old reliable manufacturers of automatic oil heat.**

**Let us send you more information. Send the attached coupon.**

## The NU-WAY CORP.
## ROCK ISLAND, ILLINOIS

*SEND THIS COUPON-AA*

Gentlemen:

Send us your new 1935 catalog and more information about the quality oil burner market.

Signed .....

City .....

State .....

ARE YOU SELLING SAFE AUTOMATIC DAMPER CONTROLS?

IN EVENT OF CURRENT FAILURE COOK CONTROL WILL CLOSE THE DRAFT DOOR AND OPEN THE CHECK DOOR.

SELL THE EFFICIENT, NOISELESS, SAFE COOK HEAT CONTROL

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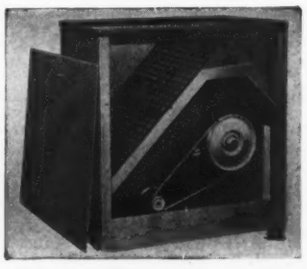
2700 Southport Avenue, Chicago

Controls for { Gravity Installations / Blower Installations / Air Conditioning Installations

WHEELS . . . . HOUSINGS
...COMPLETE FAN ASSEMBLIES...

The LAU PACKAGE UNIT

Blower complete with filters, motor, furnastat, canvas connections and cabinet.



Lau announces it can now furnish wheels in various sizes . . . housings in various sizes . . . to fit practically any type of application. It will pay those who wish to fabricate their entire line to investigate this new Lau service.

Prices are attractive. Write now for complete information.

LAU HEATING SERVICE, INC.
DAYTON OHIO

## Cooling Calculations

(*Continued from page* 33)

According to the data sheet the total cooling load will be approximately 48,000 B.t.u. per hour.

### Amount of Water

The amount of water required is figured as follows:

We allow the water temperature to rise 10 degrees going through the coil. Our entering water temperature will be 55 degrees. Our leaving water temperature will then be 65 degrees. The formula is—

Amount of water

$$= \frac{\text{Total Ht. loss in B.t.u.}}{10 \text{ (water temp. rise)}} = \text{lb. water per hour}$$

$$= \frac{48{,}000}{10} = 4{,}800 \text{ lb. per hour}$$

$$= \frac{4{,}800}{8.33 \text{ (Wt. 1 gal. water)}} = 576 \text{ gals. per hour.}$$

### Coil Size

We figure the area of coil required from the formula—

$$\text{Square ft. of coil area} = \frac{\text{Total heat loss in B.t.u.}}{\text{k times } (2_2 - t)}$$

$$\text{Area then equals } \frac{48{,}000}{5 \times 10} = 960 \text{ square feet.}$$

k = coefficient of heat transfer for coil from manufacturer's rating.

$(2_2 - t)$ = temp. difference in entering and leaving water.

Coils are rated in area of face surface according to the number of rows of tubes in the coil and the area of the extended fins attached to the tubing. One company recommends for this job a coil with 6 rows of tubes and having a face area of 2 by 3 feet. The cost of such a coil is $279.00 less 15 per cent to a contractor. 500 feet per minute velocity of air through the coil is recommended at at least 30 pounds of pressure on the water.

The resistance of the coil alone is .27 of an inch. Adding to this the resistance of the filters, pipes, furnace, etc., you will have about ⅝ of an inch of resistance.

For cooling we recommend a 5-minute air change. The total cubage to be cooled including the kitchen, is just under 15,000 cubic feet. It was planned to cut off the kitchen, but leave its cubage figured in for a safety measure in case the owner should want to turn cool air into the kitchen.

With 15,000 cubic feet of space and a five-minute air change the fan must deliver 3,000 c.f.m. against the ⅝-inch of resistance.

## Facts From Research Residence

(*Continued from page* 30)

dicated as Case 1 in Fig. 6. A fan is used to blow air through a given duct.

In Case 1, the 10-inch diameter duct is of uniform cross-section throughout the entire length of the duct for a distance of 20 feet. At station A and station B shown in Fig. 6, static pressure connections are made in the duct in accordance with the method illustrated in Fig. 5, and are attached to manometers or pressure gages of the type shown in Fig. 4. When the fan is not operating and when no air movement exists in the duct, the pressure gages will indicate a zero reading. In other words, the pressure inside the duct is equal to the atmopheric pressure outside the duct, and hence no pressure reading will be indicated on the pressure gage.

Suppose now in Case 1 that the fan is started up at low speed and air is delivered outward through the 10-inch diameter pipe. The pressure inside the duct will become greater than the pressure of the atmosphere on the outside of the duct, and hence a pressure reading will be indicated on the pressure gages or manometers. It should be noted that the manometer at station A indicates the difference in pressure that exists between the inside and the outside of the duct at station A, and that the manometer at station B indicates the corresponding difference in pressure at station B.

### Typical Example of S. P. Measurement

A simplified diagrammatic sketch of the pressure gages, located at stations A and B, is shown in the center part of Fig 6 as an example of a typical case in which air is being carried from station A toward station B. It may be noted in this typical example that the static pressure reading at station A is 0.4-inch water gage and that at station B is 0.25-inch water gage. The difference in static pressures between station A and station B is equal to 0.40—0.25 or 0.15-inch water gage. It should be noted that the greater pressure existed closer to the fan.

In the lower part of Fig. 6 is also shown a graphical representation of the pressure readings at the two measuring stations. Both of the pressure readings are plotted above a zero line, which corresponds to the atmospheric pressure, since in both cases the pressure readings indicate the difference in pressure between the inside of the duct and the atmosphere. A straight line is drawn from the 0.4-inch ordinate (in the lower part of Fig. 6) to the 0.25-inch ordinate. This line represents the magnitude of the static pressure that exists at each section of the duct between stations A and B. Again, attention is called to the fact that the static pressure is largest when it is measured at a station closest to the fan.

In the example shown in Fig. 6, the difference in static pressure between stations A and B is a

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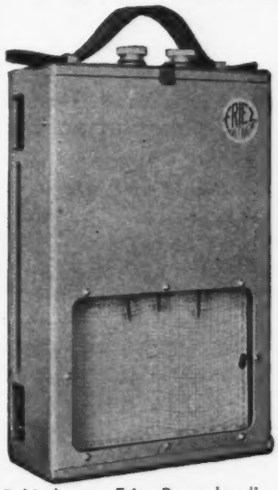

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direct measure of the loss in pressure between the two stations, and is equivalent to the pressure lost in overcoming the frictional resistance imposed by the duct to the flow of air.

In other words, *in order to deliver the amount of air being handled through this duct the circulating fan will have to deliver the air against this frictional resistance of* 0.15 *inches water gage.* Furthermore, if a larger quantity of air is to be handled through the same pipe, an even greater frictional resistance will be encountered.

### When S. P. Is a Measure of Resistance

Earlier in this article the statement was made that "it is *not* always true that static pressure measurements will give the frictional resistance to the flow of air." Yet, in the example cited in Fig. 6, the statement is made that "the difference in static pressure between stations A and B in Fig. 6 is a direct measure of the loss in pressure between the two stations, and is equivalent to the pressure lost in overcoming the frictional resistance imposed by the duct to the flow of air."

How can these two statements be reconciled? What is it then in the installation shown in Fig. 6 which enables the observer to obtain frictional resistance simply by measuring the static pressure at two stations? The answer lies in the fact that the duct is of uniform cross-section and the velocity of the air at station A is the same as the velocity of the air at station B.

*If there is any marked difference between the air velocity at Station A and Station B, then the static pressures bear no relation to the frictional resistance of the duct.*

A great deal of ambiguity and much misuse of the term "static pressure" exists in the field. It

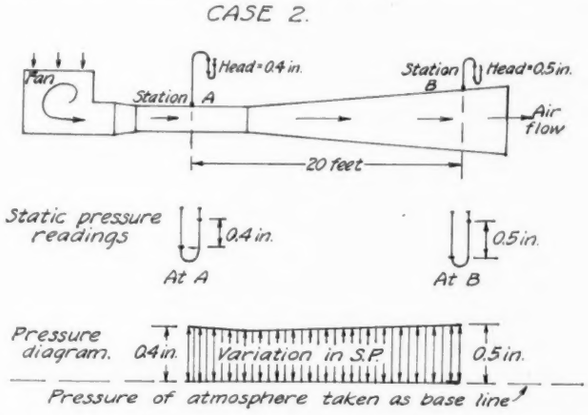


**Fig. 7—Line diagram showing static pressure measurements obtained in the case of a duct of varying cross-sectional area. In this case the differences in static pressure do not represent the pressure loss due to the frictional resistance of the duct to the air flow. Compare this case with that shown in Fig. 6.**

would be better for everyone concerned if the term were completely discarded as an index of frictional resistance.

### Total Pressure as a Measure of Resistance

A very simple example will demonstrate the absurd conclusion which would be reached if, un-

**Forced Circulation creates a new demand for an Efficient Humidifier**

Make-shift humidifiers no longer have a place in the picture. The new era of Air-Conditioning has created a new demand of humidifying equipment. It must respond properly and promptly with heating requirements. It should be designed to avoid corrosion. It should be float controlled. Because the WATER-BOY perfectly meets these requirements, many manufacturers have adopted it as standard equipment.

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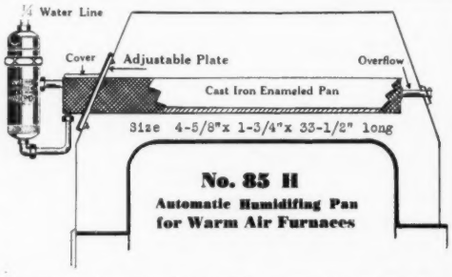
Wm. J. Woolley, Pres. 43 E. OHIO ST. CHICAGO, ILL.




Located in the furnace's hottest air, the No. 85-H cast iron baked enameled humidifying pan proves an effective and dependable unit. It is supplied with water through the reliable No. 85 WATER-BOY, which maintains a constant shallow body of water in the pan at all times. It is furnished complete with all fittings, flanges, etc., as shown, excepting the ¼" overflow pipe.

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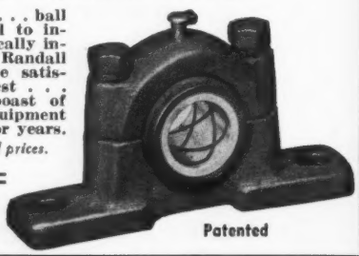

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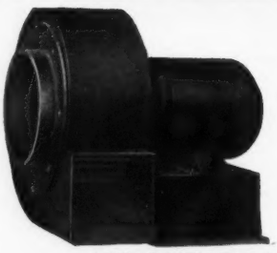

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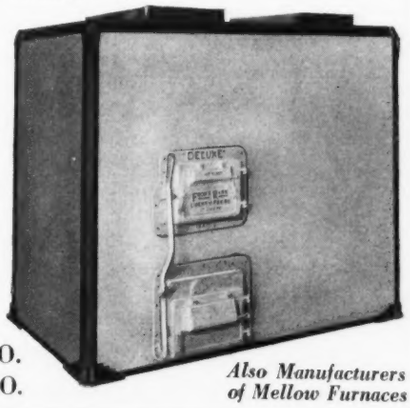

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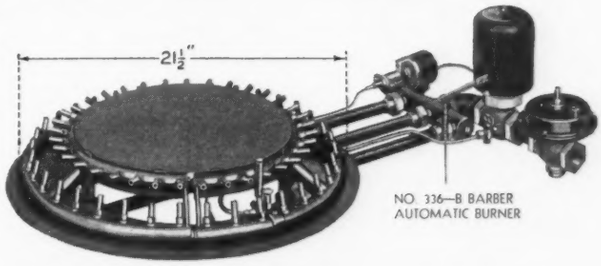


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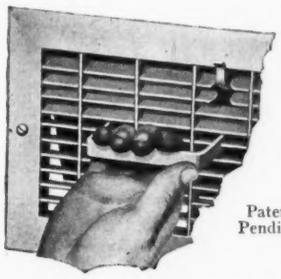
for Warm Air Furnaces, Steam and Hot Water Boilers



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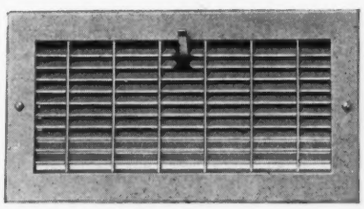

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**FOR OIL**

Monarch Fig. F-27 stainless steel atomizing nozzles have been proven superior not only by laboratory test but by actual service on thousands of burners.

**FOR AIR CONDITIONING**

Monarch ¼" Fig. H-261 male or Fig. 642 female pipe thread brass nozzles are recommended. Capacities from .57 to 18.17 G.P.H. at 40 lbs. The 2.20 gal. size at 25 lbs. is mostly used.

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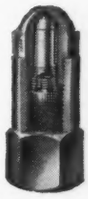


Fig. F-27

¼" Fig. H-261

**MONARCH MFG. WKS. INC.**
3303 SALMON ST., PHILADELPHIA, PA.

der all cases, one attempted to use the difference in static pressure as an index of frictional resistance. The example shown in Fig. 7 and designated as Case 2 assumes a condition in which the fan delivers air into a 10-inch duct which is connected by a transition piece to a much larger duct. The duct shown in Fig. 7 differs from that shown in Fig. 6 in that it is not of constant cross-sectional area between the measuring stations A and B, at which points the static pressure connections are made.

Suppose that in Case 2 the fan is started up at low speed until the static pressure reading at station A is 0.4 inch on the water gage. That pressure is indicated as a vertical ordinate on the pressure diagram, shown in the lower half of Fig. 7. One might suppose that the static pressure at station B should always be smaller than 0.4 inch water gage when the air is being delivered from station A towards station B. As a matter of fact, *the static pressure at station B may be less than, equal to, or greater than the static pressure at station A.*

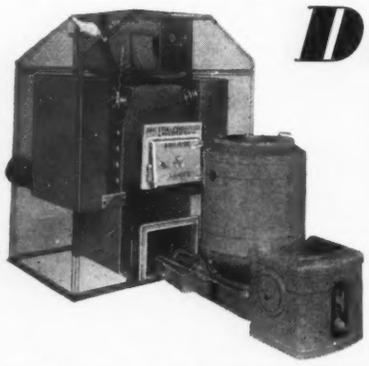
In the lower part of Fig. 7 on the pressure diagram is shown a typical case in which the static pressure at station B is greater than that at station A. It should be noted that the maximum pressure is not at the station closest to the fan. Curiously enough, the maximum static pressure occurs at a point in the duct where the duct area is the largest and the air velocity is the least.

### Flow from Lower to Higher Pressure

It may appear from the example shown that the air was flowing into a region of high pressure from a region of low pressure. If such were the case, the flow would be contrary to all our usual concepts and notions of the behaviour of air flow. However, the fact that air can and actually does flow from a region of lower static pressure to a region of higher static pressure, would lead one to believe that in the case of air flow the magnitude of the static pressure is not necessarily a good indicator of the direction in which flow will take place. Obviously then, there must be *some other pressure* which we have not taken into account. That other pressure, which we have not as yet defined, should always be of such a value that the air will flow from a region of high pressure to a region of low pressure.

That *other pressure* has been defined as the sum of the velocity pressure and the static pressure and is designated as the Total Pressure. The relationship between the velocity pressure, the static pressure and the total pressure is based on one of the oldest theorems in physics, called the Bernouilli Theorem.

(*Continued on page* 52)

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The field performance of Dailaire units over a period of five seasons show that Dailaire leads the way in low operating cost for oil or coal.

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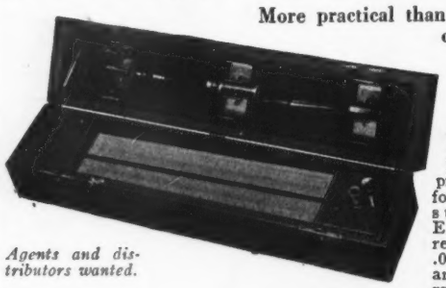
**More practical than a draft gauge or anemometer.**



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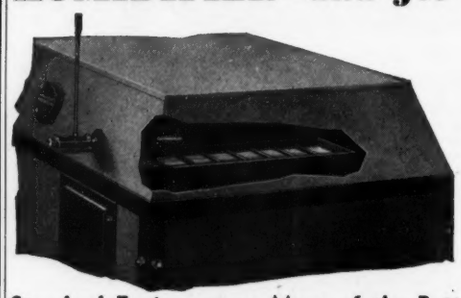

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**Type B-22** *Two-Position*
# MASTER HEAT REGULATOR

This combination of a highly dependable regulator and a low price, can get you a lot of business with the moderate salaried home-owner. It is noiseless, accurate, sensitive to changes of 1 degree, is listed as Standard by Underwriters Laboratories and it will outlast the heating plant.

*Made by the manufacturers of the famous Type B-144, the Original Gradual Control Heat Regulator.*

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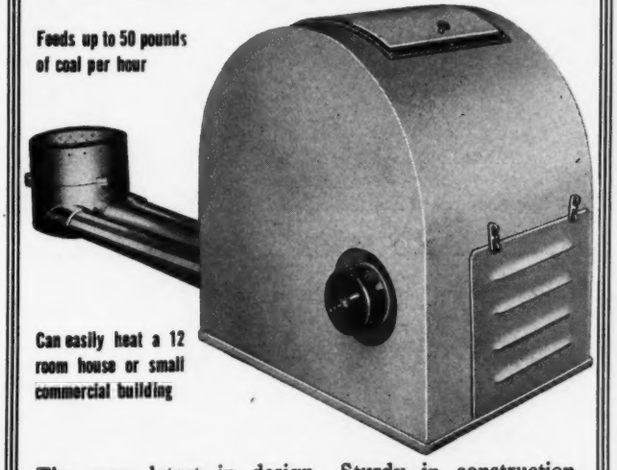
**Here is a Small Stoker that *"Can Take It"***
**Built Especially for Warm Air Heating**

Feeds up to 50 pounds of coal per hour



Can easily heat a 12 room house or small commercial building

The very latest in design. Sturdy in construction. Simple, quiet and economical in operation. Free from trouble and service.
With our stoker, you can now offer your customers automatic coal heat at a price they can afford to pay. It will solve your problem of meeting competition.

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**STOKER EQUIPMENT CO.**
**Sidney** **Ohio**

**The BARD AIR CONDITIONING • OIL FURNACE •**

**FOR REAL OPERATING ECONOMY**

● 15,000 sq. inches of heating surface assures 30% to 50% lower fuel consumption than any conversion unit. Provides washed, humidified, forced circulating air!

*Dealers Wanted!*

**The BRYAN PLUMBING AND HEATING CO.**
**BRYAN** **OHIO**

For furnace manufacturers who buy wheels only, Clarage offers any size desired, and can meet any quantity requirement. Clarage Wheels can be furnished standard width, or any percentage of standard width to deliver a specified volume of air at any operating speed. All wheels are PERFECTLY BALANCED for quiet operation without vibration.
Clarage Furnace Fans (complete assemblies) combine many advantages. They are positive centrifugal type, very compact, highly efficient, and the low speeds insure SILENT OPERATION. Inlets and outlets are drilled with holes for easy attachment to ducts.

Clarage Fan Company, Kalamazoo, Michigan

**CLARAGE**
Air Handling and Conditioning Equipment

## Controls For Cooling

(*Continued from page* 43)

and more if the cost is feasible. What this increase in air change means in apparatus is most readily seen by taking the manufacturers' catalogs. We have a certain air delivery for heating. We want so much more air. This means the fan must operate at a higher tip speed or we need a larger fan. The catalog tables tell the whole story. If in doubt write the manufacturer to determine if his fan will actually deliver the air we want under higher speeds. Some fans won't.

This increase from four or six to eight or ten probably will not be satisfactory for night air cooling. The University of Illinois recommends at least 16 air changes per hour, but we can get by with 12. Anything less means uncertain results, particularly with a basement fan and ducts because such a system does not get the direct air exhaust found with an attic fan system.

### Conclusion

In conclusion we may say that ice tank water and cold well water through coils or sprays (but coils preferably) makes a simple, relatively inexpensive installation which is perfectly satisfactory. There is little use in making our operations any more complicated than necessary so our control system should be simple. Very little control apparatus is required and the hookups can be installed or adopted from the heating system control without trouble.

## Facts From Research Residence

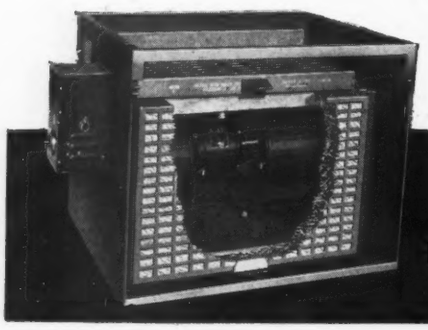
(*Continued from page* 50)

### Conclusions

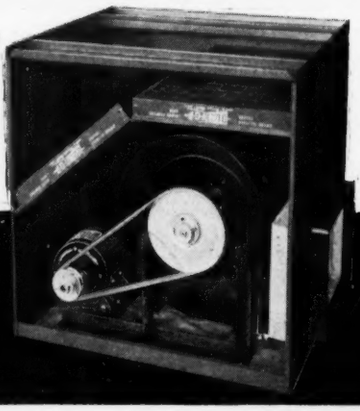
In the following article the subject of pressures and their method of measurement will be completed. In that article a more detailed study will be devoted to Total Pressures. At this point it is sufficient to emphasize the following facts pertaining to the relationship between static pressures and total pressures:

1. Static pressures are not always a true indication of the resistance to air flow in a duct.
2. Static pressures give correct indications of the frictional resistance to air flow, *only when* the velocity of the air flow at the two sections at which the measurements are made are equal in magnitude.
3. It is possible for the air to flow from a region of low to a region of high static pressure.
4. It is not possible for the air to flow from a region of low Total Pressure to a region of high Total Pressure.
5. The differences in the Total Pressure, and not the static pressure, always give the true index of the frictional resistance.
6. The total pressure at any point in a duct system is equal to the sum of the static pressure and the velocity pressure at that point.


**DEPENDABLE BLOWERS ....**



Buy blower equipment that has been thoroughly tried out. Peerless blowers have been used for the past five years by some of the largest furnace and air conditioner manufacturers in the country. Both belt and direct drive available—completely manufactured in our own plant.



Peerless
ELECTRIC COMPANY
DIVISION NO. 7
WARREN, OHIO

*IT DOES THE JOB* **WISCONSIN HUMIDIFIER**
**ENTIRELY AUTOMATIC**

Will improve any Warm Air System.
The most efficient and dependable method of supplying moisture to the home, in proportion to the heat generated.
Easy to install—No service calls.
Not affected by hard water or changes in the water pressure.
Operates equally well with any fuel.
Perfect for mechanical jobs.

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**Will Be**
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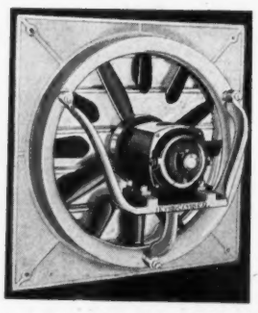

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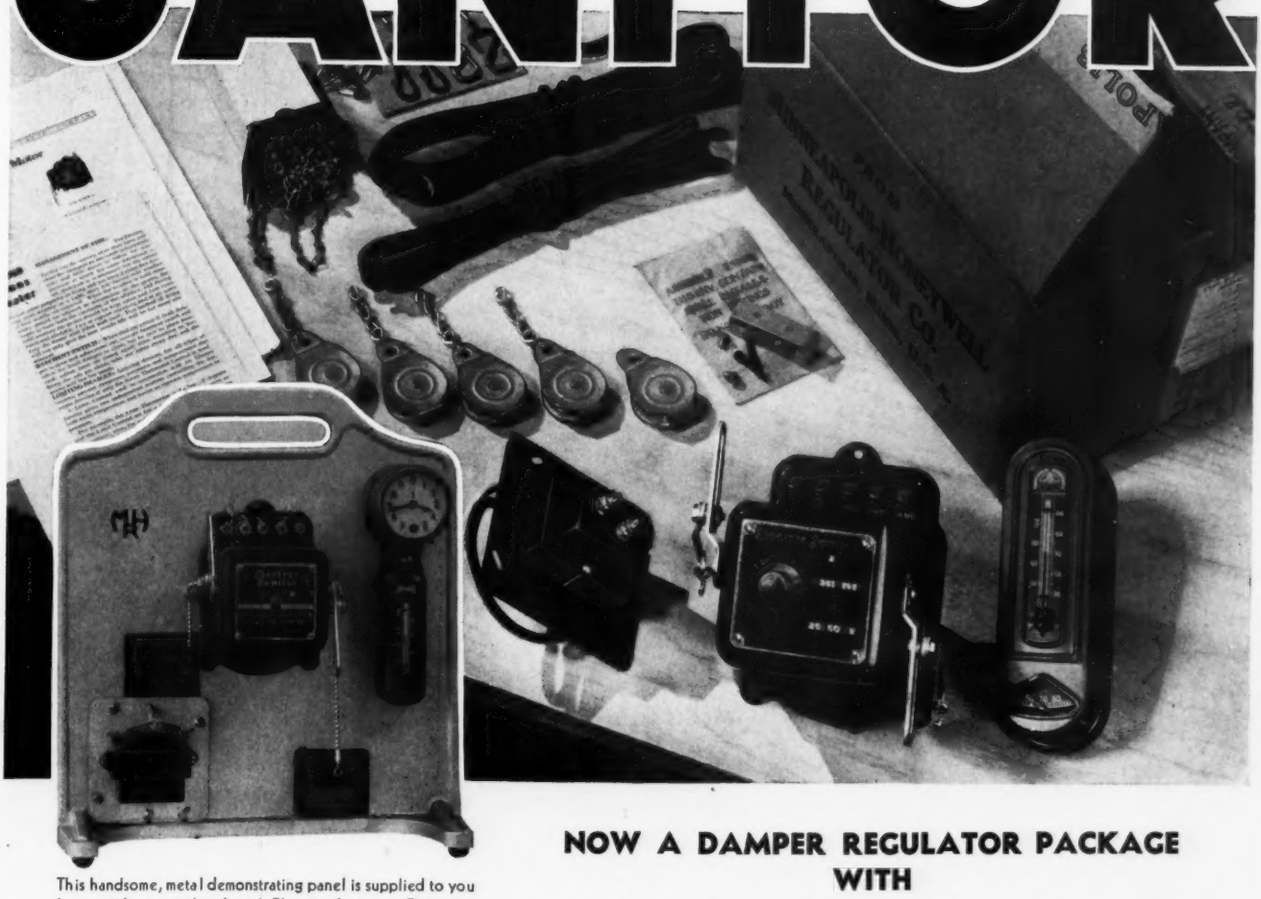
Furnace, Ventilating and Sheet Metal Companies Should Not Be Without It.

**INTERNATIONAL ENGINEERING INC., DAYTON, OHIO**

# The ELECTRIC JANITOR





This handsome, metal demonstrating panel is supplied to you free with an order for 6 Electric Janitors. Get yours today. (There is no charge for mounting either standard or deluxe Electric Janitor equipment on the panel for you.)

## NOW A DAMPER REGULATOR PACKAGE WITH

## *Heat Leveling Thermostat*

THE Minneapolis-Honeywell Electric Janitor package now has the "Heat Leveling" Thermostat — a sensational and revolutionary instrument which operates on the proved heat actuating principle. The Electric Janitor Heat Leveling Thermostat eliminates both underheating and overheating and provides level temperature at all times by means of a small metal heat retainer or "sponge", which is electrically heated. The sponge provides a minimum "on" period (from 6 to 14 minutes, depending upon adjustment) and assures the generation of sufficient heat to cause circulation. The Electric Janitor, with the new Heat Leveling Thermostat, represents the last word in damper regulators, yet it is available today at a new low price. For information write Minneapolis-Honeywell Regulator Co., 2726 Fourth Ave. So. Minneapolis, Minn.

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**MINNEAPOLIS-HONEYWELL**

*Control Systems*

**BROWN INSTRUMENTS** For Indicating, Recording and Controlling

# And Now—You Can Reap Big Profits from Air Conditioning

Air Conditioning — the talk of the country today and the fastest growing industry in modern times—offers every furnace and sheet metal dealer a wonderful opportunity to get into a new business with plenty of prospects, quick sales and large profits.

Hundreds of home-owners in your neighborhood are *sold* on the idea of air conditioning their home. But they have not purchased their equipment because the cost of the average system was far beyond their means.

Today, *you* can offer every owner of a warm air furnace, an efficient, *low cost* air conditioning unit—the AIR-PAK.

*Don't wait* until someone else beats you to these profits. Write at once for complete details, selector chart and prices. Get started *now.*

Air CONTROLS INC.
Division of
The Cleveland Heater Co.
1935 W. 114th St., Cleveland, O.

## AIR-PAK

WITH THE FAMOUS PATENTED MILES AUTOMATIC BY-PASS LOUVRES

# ASSOCIATION ACTIVITIES

## Wisconsin

Members of the Sheet Metal Contractors' Association of Wisconsin have received, through the secretary's office, mimeographed copies of Chapter 182, Laws of 1935, for the State of Wisconsin. This proposed act is intended to be an instrument for the stabilization of employment and the promotion of fair trade practices following the removal of NRA and its codes. The act is intended to be in effect until July 25, 1937, or to be terminated sooner if the governor shall by proclamation declare that the emergency, recognized by portions of the act, has ended. All codes approved or adopted under the act will be effective until July 25, 1937, unless terminated by the governor.

To effectuate the policy of this act, the governor of Wisconsin may delegate any of his functions and powers under this chapter, except the power to prescribe, approve, disapprove, modify, amend or terminate codes, to such officers, agents and employes as he may designate or appoint. Under the act the power is granted to any organization to set up a code of fair practices and to designate such unfair methods of competition as the industry may think advisable. The governor is vested with power to investigate, ascertain and prescribe reasonable codes or standards of fair competition and trade practices for the various trades and industries in the state in which the competition is essentially intrastate or to cover certain trade areas within the state and is further impowered to make reasonable classification of persons, employments and standards of fair competition and practice in such businesses.

A reasonable public notice and hearing shall be given to any industry and the governor may approve the trade practices set up if he does not find the regulations tend to promote monopolies or to eliminate or oppress small enterprises. The governor may impose conditions such as the keeping of accounts for the protection of consumers, competitors, employes and others interested in the particular industry covered by any code. In cases where a code approved under this act or a statute conflicts with the statute administered by the public service commission of Wisconsin, the public service commission ruling shall prevail.

Among other things, the codes of fair competition shall establish standards of maximum hours of labor, minimum rates of pay and working conditions. In any code which sets up as an unfair practice the selling below cost of production or reasonable cost, the governor may provide a method for determining said cost.

Paul L. Biersach,
Secretary.

◆

## Fox Valley, Illinois

Members of the Fox Valley Furnace and Sheet Metal Contractors' Association staged their second annual field day July 17, at the Bartlett Hills Country Club, Bartlett, Illinois. A golf tournament for members and visitors was held earlier in the afternoon with prizes for both those who were lucky and good golfers. The annual horse shoe pitching contest attracted a large number of entrants with the cup won last year by Walter Joy changing hands for the coming year. Secretary Eissler of the Fox Valley Association was finally declared the winner. Excellent weather and an interesting program brought out a large attendance both from the membership and the Chicago and western suburbs.

◆

## Chicago

Chicago, Gary, Northern Indiana and Southern Chicago contractors held a get-together meeting at the South Chicago store of the Northwestern Stove Repair Company July 12. With T. R. Mackin as master of ceremonies and J. A. Miedema as chairman of the meeting, the principal speaker of the evening, Arthur F. Frazee, vice president and general manager of the Rudy Furnace Company, Dowagiac, Michigan, delivered an inspirational address on the general subject of future possibilities for the warm air heating contractor. Mr. Frazee pointed out the progress made under codes and general organization activities of associations throughout the country. He laid emphasis on the future of air conditioning and forced air heating, particularly for the small commercial and residential prospect. In Mr. Frazee's opinion, the industry has never been in a better position to capitalize on the improvements in equipment and knowledge which has served to place the warm air heating contractor in an advantageous position. The one thing needed above all else, in the opinion of the speaker, is better salesmanship by means of displays, canvassing, advertising and a general improvement in the sales methods employed by large and small contractors.

Following Mr. Frazee, Lloyd W. Charlesworth, vice president of the Omaha Stove Repair Works, Omaha, Nebraska, discussed some of the problems of jobber-contractor relationship. Mr. Charlesworth pointed out the changes which have taken place in business conditions and in the relationship. He emphasized that the jobber is now in a position wherein he must render better service and in many cases must take the initiative toward improvement in heating work.

◆

## Milwaukee

The first meeting of the new Board of Directors of the Heating and Sheet Metal Contractors Association of Milwaukee, was held July 25 at 8 P. M., at 1219 S. 16th St., for the election of officers for the coming year. The following were unanimously elected to office:

Edwin F. Arndt—Pres.
Albert A. Walters—Vice Pres.
John Dalton—Financial Sec'y.
John H. Goodwin, Jr.—Treasurer.
Herbert H. Peters—Corresponding Sec'y.
Norman J. Harris—Recording Sec'y.

The above named, with the three named below, constitute the full Board of Directors.

Robt. H. Fetting.
Eugene Droegkamp.
Edward S. Strobel.

John Dalton, Financial Sec'y.

◆

## Chicago

The Master Furnace and Sheet Metal Contractors' Association of Chicago continued to hold their regular monthly meeting, with the early part of the evening devoted to the class in gravity and forced warm air heating. The association plans to hold its annual picnic August 25, at Volbrecht's Grove, 167th and Stony Island Avenue. John Titertington is chairman of the entertainment committee with George Deibel, Emil Woodstrup, Ed. Nemec, Carl Larsen and Fred Hall as other members of the committee.

# An Irregular Transition Fitting

**Pattern prepared for a reader who requested an accurate pattern rather than a short cut method. The pattern has been developed by a method which insures accuracy. Questions will be answered.**

## A Round Horizontal Base to a Round Vertical Opening

By L. F. Hyatt
Contributing Editor

BEGIN by drawing the vertical and horizontal center lines *AB* and *CD* of the front elevation view. Next draw the circle representing the small vertical opening and divide this circle into spaces and number as shown. Draw the horizontal line *EF* tangent with the circle just drawn and step off a distance equal to the diameter of the large base opening.

### Diagram of Lines

Now draw the sloping lines from *E* and *F* tangent to the circle as shown. Next draw the side elevation as shown, the base being of course equal to the diameter of the large horizontal opening and the altitude on the left side being equal to the diameter of the vertical opening. Draw the plan view by first drawing the vertical and horizontal center lines. Then draw the large circle and divide it into spaces as shown.

Through point *1* on the circle draw a vertical line tangent to the circle. Now draw circle *G* which represents the vertical opening and number this circle as shown. Project horizontal lines from each of these points until they intersect the vertical line which was drawn tangent to the large circle, thus locating *1"*, *2"*, *3"*, *4"*, etc. on the vertical line.

Now draw solid line *1"* to *7*, dotted line *7* to *6"*, solid *6"* to *6*, alternating lines solid and dotted until the group of lines on the bottom half of the large circle of the plan is completed.

These lines represent the long lines. The short group of lines was drawn in the upper half of the circle instead of in the lower half since so many lines would have been confusing. The solid and dotted lines are alternately drawn as before, connecting, this time, points *4*, *3*, *2*, *1* with the points on the vertical line *4"*, *3"*, *2"*, etc.

### The Elevation

We may now proceed with the diagram of true length lines. Draw the horizontal line *M-N* and also the vertical line *1-O* from a point near the center of the distance *M*, *N*, and upon this line step off and number the distance found upon the vertical line of the side elevation. From point *1* on the diagram of lines step off the distance *7"* to *7* found on the plan view thus locating point *7* in the solid line group. From point *7*, just located, draw a solid line to point *7'* found on the vertical line. This is the true length of *7'-7* of the plan view.

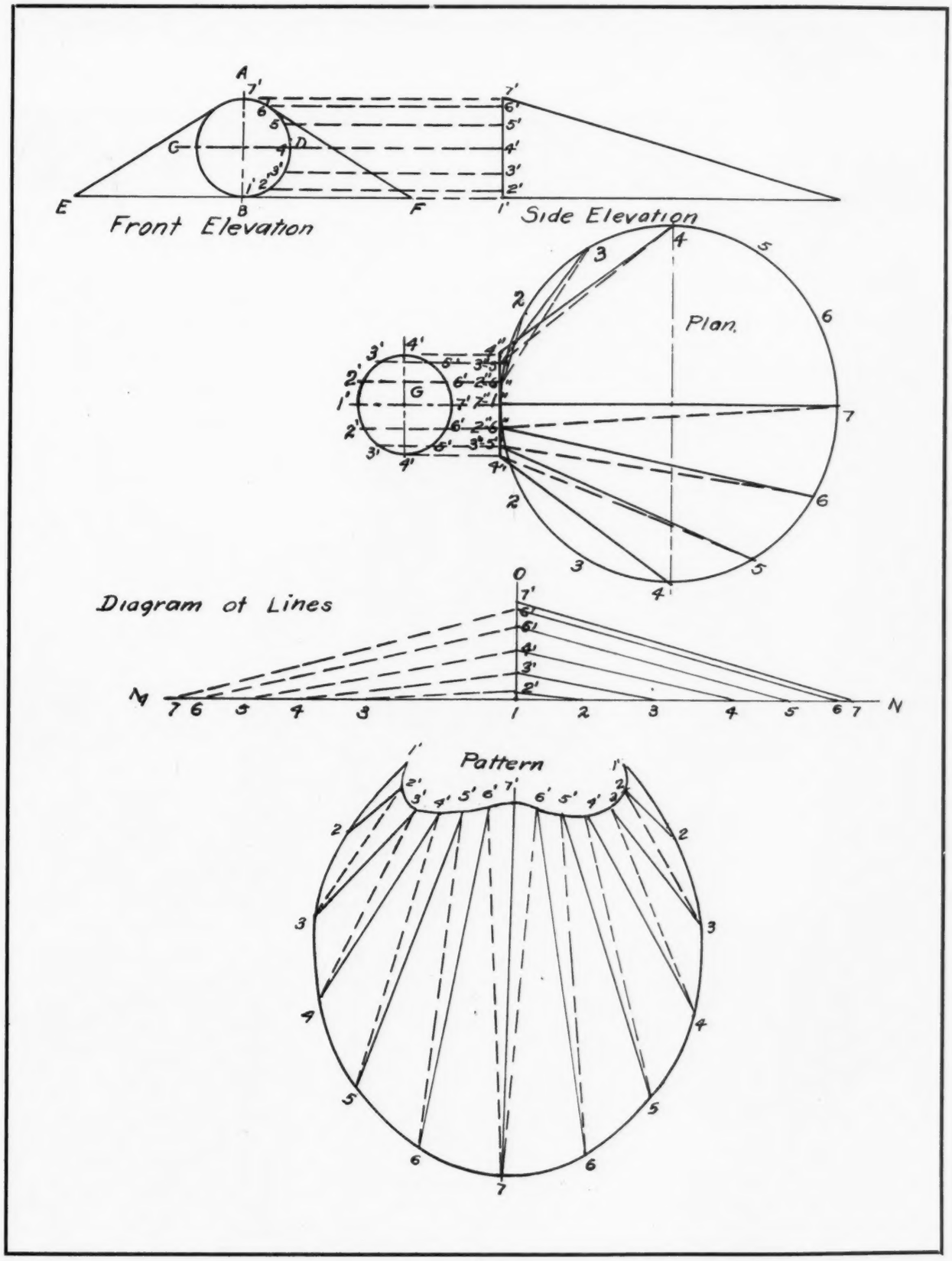
Then take the next solid line *6"-6*, found on the elevation view and step off on the line *M*, *N* as before, locating point *6*, and as before connect this point with *6'* on the vertical line. Continue with all of the solid lines of both halves of the plan view. The same procedure is followed with the dotted lines. It is important that the lines be drawn to the correct points when preparing the diagram of true length lines since one line drawn incorrectly will ruin a pattern.

### The Pattern

We have now completed our diagram of lines and are ready to develop the pattern and in this case we will not make any allowances for seams, etc.

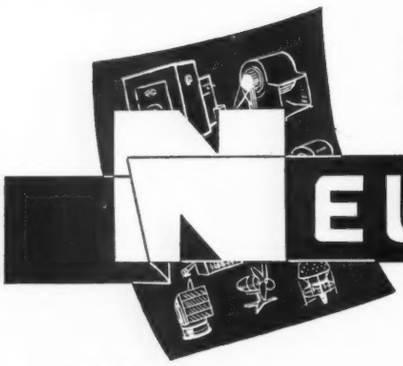
Begin the development of the pattern by first drawing the line *7* to *7'* equal in length to the distance *7* to *7'* found on the solid line group. Now from the dotted line side of the diagram of lines take the distance *7* to *6'*, this being of course the true length of the line *7* to *6"* found on the plan view, and with *7* as a center strike arcs each side of point *7'* on the pattern. Next take the distance *7'* to *6* found on the profile *G*, plan view, and with *7'* on the pattern as a center strike arcs intersecting the arcs previously drawn and locating the two numbers *6'*.

The next line on the plan view is the solid line *6* to *6"*. The true length of this line is found from *6'* to *6* in the solid line group in the diagram of lines. With this distance as a radius and points *6'* on the pattern as centers strike arcs of indefinite length. Next using the distance *7* to *6* found on the plan view and *7* on the pattern as a center, strike arcs intersecting the arcs just drawn locating points *6* on the pattern. Continue by using the dotted line *6* to *5'* found in the dotted group of the diagram of lines. Now with points *6* on the pattern as centers and this length as a radius strike arcs of indefinite length. With the point *6'* on the pattern as a center




and 6'-5' found on profile *G* on the plan view as a radius strike arcs intersecting the arcs just drawn, thus locating points 5' of the pattern.

Continue with all the true length lines in the proper order up to and including 2-2'. Now with 2'-1' of profile *G* as a radius and 2' of the pattern as a center strike arcs. Then take the distance 2-1" of the plan view as a radius and 2 on the pattern as centers and strike arcs intersecting the arcs just drawn thus locating points 1' on the pattern and completing the pattern.



**For your convenience a number has been assigned each item. Check the items in which you are interested on the coupon on page 68 and mail to us. Complete information will be forwarded.**

● Indicates product not listed in 1935 Directory

△ Indicates product and manufacturer not listed in 1935 Directory

# NEW PRODUCTS

### ● 175—Cap Screws

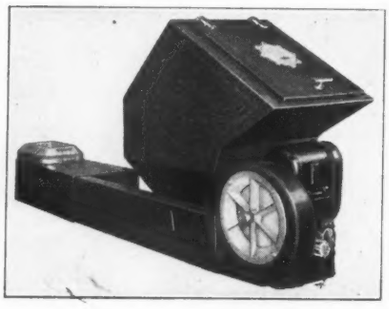
Parker-Kalon Corporation, 190 Varick Street, New York City, announce a line of self-tapping cap screws. Like all other self-tapping screws, these new units form their own thread in the material as they are turned in. These hexagonal head cap screws can be used in sheet metal as light as 24-gage and up to 10-gage; in steel plates and structural shapes up to ½-inch thick; and in solid sections of many other materials including brass, bronze, aluminum and die-castings, slate, transit board, asbestos, etc. In order to use the self-tapping screws it is only necessary to punch or drill holes in the parts to be assembled and turn the screws in. No lock washers are required. The new hexagonal head tap screws will be made in all stock sizes from No. 6 to No. 14.

◆

### 176—Domestic Stoker

A De Luxe model automatic coal burner for household use, has been developed and placed on the market by the Link-Belt Stoker Division, 2410 W. 18th St., Chicago.

The new stoker has a high-gloss maroon finish with special striping; has a sectional rectangular retort similar to large stokers, with both inside and out-

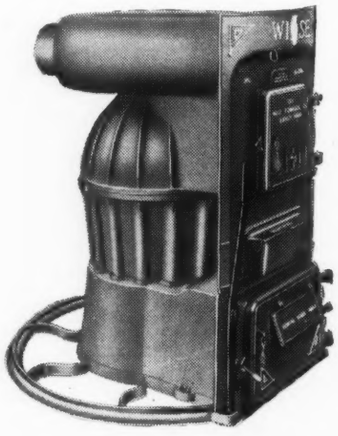


side air ports; statically and dynamically balanced cast aluminum fan with "air stream" inlet control; and other features.

The controls include a time clock thermostat, which makes it unnecessary for the stoker owner to turn the thermostat back to 60° each night, and up to 70° each morning. Other controls include a stack switch which keeps the fire from going out during the night, and a limit control which prevents overheating in case a window is opened near the thermostat and the latter "keeps calling" for heat.

### 177—New Furnace

The Wise Furnace Company, Akron, Ohio, announces a new series "A" warm air furnace with features that increase the efficiency, ease of operation and general durability. The furnace is cast iron and will be manufactured in



three sizes of 20, 22 and 24-inch firepot diameters. Pipe area ratings are 409, 512 and 629 square inches.

The features of the furnace are: one-piece, self-cleaning radiator; one-piece cellular firepot; entirely new design of ashpit and front; radiator and feed section are cast in one piece with a feed section similar to the No. 20 series, having an extended feed pouch which permits the surface ground feed door and slip-over front; new water jacket which protrudes into the large opening from combustion chamber to radiator; ashpit section is extended to provide a well-fitting surface ground door; ashpit and lower front are cast in one piece, eliminating the joint between the ashpit and front; one-piece base is bolted to the ashpit to insure a tight-fitting door and duplex grates.

◆

### 178—Propeller Fans

General Regulator Corporation, 2608 West Arthington Street, Chicago, Illinois, announce the dual-air propeller type fan. It is said to take all its air from in back of the fan which eliminates tip front suction, whirlpooling outside air around blade tips and provides a live center which keeps the motor cool.

The fan has four airplane-type blades with a slotted design which gives a double blade effect. The fan is made in 16, 20, 24 and 30-inch sizes ranging from 7000 c.f.m. free air delivery in the smaller size to 12,000 c.f.m. free air delivery in the large size. The fans are also rated for all static resistances from free air delivery to one-inch.

◆

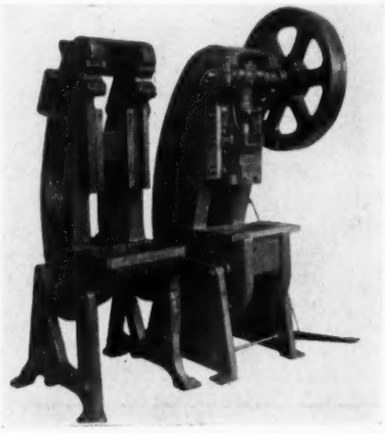
### 179—Stokers

The Will-Burt Company, Orrville, Ohio, announces the new No. 40-50 standard stoker of ultra-modern design with new and improved exclusive features. All corners and projections have been eliminated for streamlined appearance. Mechanically, the hopper is built lower, has a larger opening and larger capacity. The vent tube is now inside the hopper and the motor is fully enclosed. An automotive type continuous feed power unit provides six different coal feeds. The shear pin is fully enclosed and can be replaced without tools. The new unit has the company's standard line of automatic air control shutters. The stoker will also be furnished in a de luxe model which has been still further refined as to appearance.

◆

### ● 180—Press Frame

The Quickwork Company, St. Marys, Ohio, announce a new and patentable design of welded steel press frame which can be used in rebuilding all sizes and makes of inclinable presses—both flywheel and back-geared types. The cost is said to be comparable to the cost of a new



cast iron frame. The advantages are said to be greatly increased rigidity resulting in longer die life. The side members of the frame are made of box sections thus reducing the weight. The Quickwork Company has equipped itself to handle all such repair work.

# New Products . . . . . .

### 181—Steel Furnace

A new, low-priced, steel furnace has been added to the Sunbeam line of warm air heating plants according to a recent announcement from The Fox Furnace Company, Elyria, Ohio.

The new line, to be known as the Series No. 500, provides this manufacturer with two distinct lines of steel,

boiler-plate type of furnace. The No. 500 Series will be limited to 4 sizes, with drums ranging from 20" to 27" in diameter.

According to officials the new furnace has several features not generally incorporated in a heating plant in the lower cost brackets. The unit is of steel construction with joints both riveted and welded.

◆

### 182—Air Filter

A new air filter, using animal hair as the filtering media, is announced by Wilson & Company, Hair Division, 4100 South Ashland Avenue, Chicago, Illinois. The animal hair fiber is a by-product of the packing industry and is non-absorptive, resilient and permanent. The animal hair is specially treated and prepared for the purpose of filtering and is thoroughly sterilized and de-odorized.

In making up the individual cell the central portion is built of fibers having a high degree of resiliency, in order to maintain the media in its expanded condition. The outer portion is treated with a special fixative which maintains the form of the entire pad. The back portion or outlet side of the pad is treated with a special adhesive oil for catching and retaining the dust. The fibers on the face of the filter are formed mechanically into corrugations and are not coated with adhesive.

The resistance of the new filter is said to be as low as .05 of an inch at a face velocity of 250 F.P.M. and to be .10 of an inch at a velocity of 380 F.P.M. The cleaning efficiency of the filter at 250 F.P.M. is said to be 95 per cent and at 300 F.P.M. 97½ per cent.

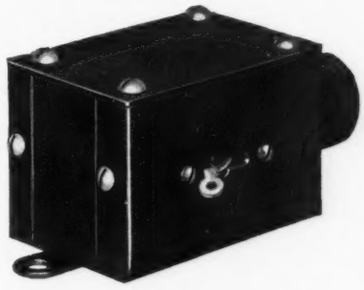
### 133—Hammer and Drill

In the new Wodack "Do-All" combination electric hammer and drill, the hammer mechanism is so constructed that there are only two working parts, both of which are made of specially treated steels. The motor is of the universal type with forced draft ventilation, and the tool may be operated from any light socket. By simply opening the chuck and loosening a cap screw, the hammer member may be removed and the tool used as an electric drill, with a capacity of ⅜" in metal. It may also be used as a portable grinder and buffer. When used as a hammer with star drills the tool drills holes in concrete and masonry up to 1⅜" diameter, and by using special tools it does chipping, chiseling, cutting and vibrating. The manufacturer is the Wodack Electric Tool Corporation, 4627 Huron St., Chicago, Ill.

◆

### 184—Zone Control Switch

To control the operation of a line voltage device such as an oil burner, a stoker or a blower, by means of the motion of a damper motor arm, it is desirable to start the blower whenever the zone damper is opened by the damper motor under the control of a room thermostat. The Hold-Heet zone control switch was developed for this



purpose. It contains a line voltage switch that is mounted adjacent the damper motor arms. A spring is provided for connecting the switch lever to one of the damper motor arms. The switch is normally held in an open circuit position by an internal spring. Whenever the damper motor arm is raised to open the ventilating louvre, it automatically closes the line voltage circuit through the Zone Control Switch. Manufactured by Russell Electric Company, 342 West Huron Street, Chicago, Illinois.

◆

### 185—Humidifier

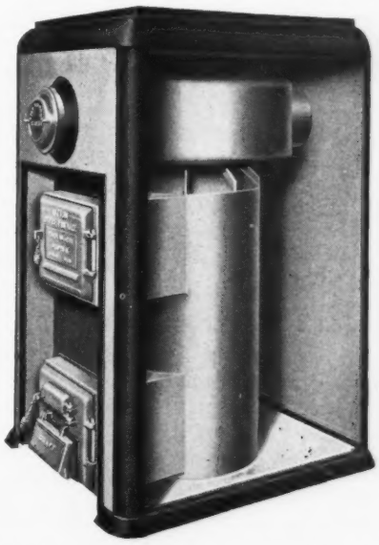
A smoke-pipe type humidifier, furnished in four sizes for 8, 9, 10 and 12-inch diameter smoke pipe and designed to use the standard humidifier of the Automatic Humidifier Company, is announced by Automatic Humidifier Company, Marshalltown, Iowa.

The unit consists of a rectangular housing with necessary collars for connection to the smoke pipe. Hot gasses of combustion pass around a rectangular opening which is cut through the housing from top to bottom. A small round pipe can be connected from the top of the unit to supply heat for any room desired. This gives the unit an economizer function. The top portion of the exterior housing consists of an evaporating pan in which a level of water is maintained by the automatic humidifier thermostat valve.

◆

### 186—Steel Furnace

The Floral City Heater Company, Monroe, Michigan, announces the Watson steel furnace, of all steel construction with die pressed sections, elec-



trically welded and air-tight throughout. The new unit comes in four sizes from 425 to 655 square inches of leader pipe rating. The furnace proper consists of a one-piece steel body, pressed into dies under enormous pressure and electrically welded with special apparatus. No riveted or cemented joints are employed. A special ribbed head over the combustion chamber is also used for extra strength. A large circular return flue radiator is directly above the combustion chamber and is adjustable for the smoke pipe. Grates are either triangular or rocker type. A pressed steel rectangular casing of special design and attractive green finish is supplied upon request or the standard galvanized iron round casing may be had.

◆

### 187—Shears

The Cincinnati Shaper Company have recently added a smaller series of machine with capacity for shearing 10 gauge mild steel in 8, 10, 12 ft. lengths.

General design is the same as in the heavy all steel shears manufactured by this company; the main frame, table and crosshead being cut from heavy rolled steel plate; hydraulic holddowns with plungers spaced at 12" center, developing a pressure of approximately 2,000 pounds each; the five jaw clutch is totally enclosed and runs under oil.

# Letters From Readers

## Thanks

**American Artisan:**

We desire to express our appreciation of the January copy of the American Artisan. We think the Directory and the Chart for estimating weight of galvanized piping by Donald Kroeker worth the price of the magazine for a year.

Would like very much to purchase this chart printed on celluloid if available, as it fills a long felt want in our line.

However, we would like to see 28-gauge metal added to make it complete for small size piping for forced air residence work.

J. W. Kaelin,
Evansville, Ind.

◆

## Licensing Law

**American Artisan:**

We have read with interest your articles in February, 1935 issue, on page 51, by J. E. Peterson, secretary of Warm Air Heating Contractors of Du Page County, Illinois.

We are very much interested in the act which they are presenting to the general assembly, but as stated by Mr. Frank Myers of Owen-Illinois Glass Company in your article on page 15 of the same issue, there should be a clause inserted in this act to control the final selling price.

Owing to the fact that the quantity buyers such as mail order houses, and direct to you sellers can obtain a discount of from 36% to 49% below the small dealers' price, as stated in your article on page 50 by Adolph Hesse, secretary of New York State Sheet Metal and Roofing Contractors.

My suggestion is this — that any dealer engaged in the retail sale of any articles pertaining to this industry shall establish his retail price on the dealers unit for package cost and not on quantity purchases and that a mark-up of not less than 25% for overhead covering such items as listed in Article 5, section 5 of the Code of Fair Competition for the Roofing and Sheet Metal Contracting Industry and an additional mark-up of 10% for profit.

It is very evident that something must be done to protect the small dealers who are the people who constitute the make-up of the cities, towns and villages and who are paying rents, taxes, labor and various other items forming the type of commerce that really keeps a country on the move.

Under the present method of doing business we are NOT getting out of the old tooth and claw method which our Honorable President says we must not go back to, really the present method is throwing us more and more into the grip of the old tooth and claw method.

It is my firm belief that when we control the retail price this industry will come out of the back alleys, garages, etc., and price cutting and cut throat competition would pass out and in its place would come a competition of fair dealing, good service, good quality and such as would add dignity to the trade.

An example of this is the gasoline business. Here in Ohio you pay the same at all stations but there is a strife for business by way of service, neat and attractive stations, convenience for the traveling public and some one to assist you the moment you stop.

If the retail price was established and was compulsory, then the quantity discounts would only mean that much more profit for the dealer who was able to pay that way.

Geo. D. Viers,
Canton, Ohio.

◆

## Duct Quantities

**American Artisan:**

We received our copy of the January American Artisan yesterday and have read with interest the article on figuring the cost of duct work.

While we feel that the chart worked out will certainly be of considerable help, it still does not enable the air conditioning salesman and dealer to quote an approximate price on the duct work of a particular job. We feel that it should not be necessary to lay out the complete job before submitting an approximate estimate, but at the present time the only way we have been able to secure the cost of duct work is from one dealer who has had so much experience that he can estimate it roughly or by laying out the entire job and then having some sheet metal man give us a price.

The article was very helpful if the layout is already made, but we would like to do this figuring before making the layout. If you have any suggestions in the future, we would be glad to hear from you.

Carl Sahler,
The Thatcher Co., Newark, N. J.

## From an Old Timer

Waukegan, Ill.—In the October issue of AMERICAN ARTISAN I read the article under the title, "We Lay an Egg."

May I give a partial answer? As an individual I am not going to allow myself to take this to heart too seriously, but I cannot for the life of me understand why the warm air furnace dealer in the field should be blamed entirely for the condition as it seems to exist. Does it not seem possible that some manufacturers who want to sell the dealer furnaces, fittings, etc., have taken for granted that the majority of warm air furnace contractors are the type mentioned and have gauged their sales and disposal of equipment accordingly?

I wonder if the majority of furnace manufacturers and supply houses have not taken this attitude: "What do we care for the dealer, we are out to sell our merchandise, and at all cost." More power to them BUT where does the co-operation come in?

I remember, not so many years back, just before the close of prosperity, I had occasion to stock furnace fittings. I also remember that the supply house I bought of came into our local territory underbidding every job I had occasion to bid on. Did I do business with them again? Well, you answer.

What was the dumb dealer out in the field supposed to do—take a loss in order to make the sale? The Standard Gravity Code also was available at that time—were these jobs installed accordingly? They were not. While the local contractor was trying his utmost to create this thing called prestige in the community he was prevented by chiselers and at the same time slapped in the face and called a robber by probable customers.

I also recall a furnace manufacturer (no need to mention the name) taking a loss of about $33,000. The firm installing their furnaces came into local territory taking job after job away from the legitimate local dealer. The only thing for the local dealer to do was to sit by and wonder why he was unable to meet this competition. Finally the situation popped wide open. If this furnace manufacturer

# 73,000 Gallons of SOUP-

SOUP is easy to make. But what a difference there is between the soul-satisfying food of the Master Chef and the wishy-washy concoction of the novice soup maker. It's a difference that comes from long experience at the kettle. The Chef who has made ten gallons of soup daily for twenty years . . . as much as 73,000 gallons of it . . . is bound to excel others.

Experience produces masters in every trade, in every line of business. Twenty years spent in developing and producing the Sheet Metal Screw has made Parker-Kalon *the Master* in this specialized branch of screw manufacture. This long experience shows up in the uniformly perfect results which genuine Parker-Kalon Sheet Metal Screws give, as distinguished from the uncertain action of imitations that merely "look like" them.

**Genuine Sheet Metal Screws guarantee assembly economy!**

They *always hold* because the threads run full diameter right to the head. They *always go in easily* because the threads are designed with expert knowledge of the work they must perform and held to a high degree of uniformity. *Their threads don't strip, nor do the heads twist off* because they are made from a special analysis wire and are hardened by an exclusive process developed from 20 years' experience in making Parker-Kalon Self-tapping Screws.

Savings of assembly time and labor depend on uniformly perfect action. To be sure of savings, insist upon Parker-Kalon Sheet Metal Screws . . . the genuine product.

★

**PARKER-KALON CORPORATION**
190 Varick Street New York

**PARKER-KALON**
HARDENED TYPE A SELF-TAPPING
**Sheet Metal Screws**
PATENTED NO. 1465148

**PARKER-KALON PRODUCTS ARE SOLD ONLY BY RECOGNIZED DISTRIBUTORS**

## Letters from Readers

thinks that he is not responsible in some degree, then it is folly to think the industry can attain its maximum stride.

It seems to me this was just a case of personal greed with no consideration given as to whether the installations would function properly or not. But they got the job instead of the dumb local dealer. Referring to that portion of the editorial (local dealers being dead from the neck up) that fits the furnace manufacturer to the extent of about $33,000. I not only think he was dead, but rotten, insofar as his business ability was concerned.

If my memory serves me right this same furnace manufacturer was shouting quite liberally for warm air furnace dealers to install according to the Standard Code, but it seems he would not take his own medicine.

Knowing that I have made mistakes and am not immune to future ones, I still think that if furnace manufacturers and supply houses will just sit back and vow to be more considerate of the dealer out in the field and really extend that so much talked of co-operation, both will make greater headway.

This trade of ours, I think, is wide open to any one and any thing. I have found that of all the furnace manufacturers who have called on me, not one has ever taken the precaution to find out whether I am capable of installing their merchandise or would install their furnaces to the best interests of the home owner and the trade in general.

Outside of the mail order house, if the furnace dealer wants to install plumbing fixtures what plumbing fixture manufacturer can he go to get these articles? To what hardware-wholesale house can the furnace dealer go to buy hardware at dealer discounts without being told—"we must protect the hardware dealer?"

I fail to see where the furnace and sheet metal shop has ever received such protection.

I remember another instance where a furnace dealer bought and sold a certain furnace for approximately eight years and practically built his business on the strength of this product. A slump came along which slowed up installations. With three jobs as much as sold, a new salesman from factory came into the territory (proves later to be a former *cheesemaker*), sees competitive dealer, gives him the agency, shortly after the three jobs of the former dealer were installed for figures ranging from $20.00 to $60.00 less than the former dealer's quotations. This new dealer shortly dropped the agency. Co-operation?

Why wonder about the existence of the alley shop, perhaps this is the only trade the owner of such a shop has. He is still trying to make an honest living for himself and family, which is something.

When furnace factory salesmen step into a building, give it the once over, and make their decision in regard to size and installation cost without even a pencil notation, what sort of an example is that for the local dealer who perhaps is in need of learning to figure installations according to the Standard Code rules and Data sheets?

If some of the manufacturers have not shown a total disregard for the individual dealer, why then do they quote tonnage prices to mail order houses and change their patterns to cast furnaces lighter in weight in order to meet a price? If this is poor practice to their dealer customers why do they thus help some mail order house to make it harder for the local dealer?

I do not mean by these remarks that a general ill feeling exists toward all manufacturers and supply houses, but I have experienced some of the conditions mentioned and am wondering if the good editor of the AMERICAN ARTISAN cannot find some germ of an idea for an article covering this situation.

—Wm. Kuehl.

Business on the Up and Up
. . . for Round Oak Dealers
Retailers Cashing in on Complete Line of Steel and Cast Iron Furnaces for Solid and Liquid Fuel
THE OIL-MASTER — Highly efficient for any make of oil burner. Made of arc-welded copper alloy, absolutely gas-tight. Adapted for gas burning with conversion burner.
THE MOISTAIR BOILER-PLATE— For coal or wood. Only one joint, double cemented tongue and groove design, bolted permanently gas-tight.
Furnace sales are definitely improving! Innumerable home owners are buying furnaces . . . comparing and checking the advantages of different makes. Help yourself to a generous slice of this new business! Arrange now to handle the nationally known ROUND OAK line . . . a complete line . . . backed by a 64-year reputation for dependability.
As the ROUND OAK dealer you can supply an efficient heating plant for every type of installation . . . steel or cast iron . . . for hand or stoker firing . . . for coal, coke, gas, or oil. ROUND OAK helps you sell . . . helps you engineer each job . . . helps you finance your sales.
Write today for the ROUND OAK dealer plan. Let us show you how you can capitalize upon the completeness and the prestige of the ROUND OAK line.
ROUND OAK COMPANY
STOVES . . RANGES . . FURNACES . . AIR CONDITIONERS
DOWAGIAC SINCE 1871 MICHIGAN
● Priced Right
With all their quality, ROUND OAK furnaces are unusually moderate in price, a valuable feature in beating competition.
● Advertising and Engineering Help
ROUND OAK experts are at your service. Valuable sales and advertising helps free. Skilled engineering advice on installations.
● Round Oak Finance Plan
This finance plan greatly increases your opportunities for making sales. Let us give you full information about it.

# News Items . . . . . .

### Reorganize Munkel Heating Company

C. O. Norland was elected president of the Munkel Heating Company, 569 North Fourth Street, Columbus, Ohio, succeeding Adolph E. Munkel, whose death was announced in the July issue of AMERICAN ARTISAN. Other officers elected at the annual meeting of stockholders include S. R. Weaver, who has been acting as sales manager and engineer for eight years, as vice president; J. W. Norland, secretary and treasurer; J. L. Gurley, superintendent for the past twelve years was named a director. The company will continue to distribute Lennox Furnace Company furnaces and air conditioning equipment and the Munkel-Lamneck cast furnaces. The company is also engaged in a general insulation business.

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### New Residence Construction

During the second quarter of this year, ending June 30, building permits showed an increase of 50 per cent over the corresponding period in 1934, according to a special analysis made of building permit reports from more than 750 identical cities to the Bureau of Labor Statistics of the Department of Labor.

In April, May and June the totals accumulated were the highest reached since 1931. Residence construction took the lead over other types of building. Gains of more than 100 per cent were noted in each of the three thirty-day periods.

A breakdown of the permit record for the 750 cities for the second quarter follows:

| | APRIL | | MAY | | JUNE | |
|---|---|---|---|---|---|---|
| NUMBER | 1935 | 1934 | 1935 | 1934 | 1935 | 1934 |
| Families Provided For | 6,588 | 2,952 | 6,875 | 3,356 | 7,231 | 2,373 |
| Residential Buildings | 4,273 | 2,046 | 4,908 | 2,127 | 4,853 | 1,886 |
| Non-Residential Buildings | 7,824 | 6,388 | 7,821 | 6,310 | 6,606 | 5,567 |
| Additions, Alterations and Repairs | 32,182 | 25,015 | 32,044 | 27,291 | 28,699 | 24,281 |

| VALUE | APRIL 1935 | MAY 1935 | JUNE 1935 |
|---|---|---|---|
| New Residential Buildings | $23,422,000 | $25,369,000 | $28,871,315 |
| Non-Residential Buildings | 25,781,000 | 23,949,000 | 28,963,214 |
| Additions, Alterations and Repairs | 19,936,000 | 20,584,000 | 18,943,333 |

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### Miniature Furnaces

Hubert Wilson, furnace dealer in Waukegan, Illinois, sends the accompanying photograph showing two small furnaces which he made last winter to use in sales work. The little air conditioning furnace has a complete blower which actually operates and a small heating element inside the furnace. Both small furnaces have lights on the inside which give a very realistic appearance. Mr. Wilson reports that he finds prospects very much interested in the two small furnaces and that their use assists him greatly in demonstrating the actual operation of a gravity and a forced air heating system.

"Headed for the seashore with the whole danged family for a good vacation, just as though there never had been a depression.'

"How does he do it? Why bless my soul, he sells 'em registers! Yes, Sir, I said REGISTERS! I Here's the way Bill put it to me himself: 'Colonel,' says he, 'I hit 'em where they are vulnerable. The ladies like attractive things for their homes. So I show them the H & C registers that I propose. They're outstandingly attractive and by the time I'm through telling them how good they are, somehow or other they get the impression that *my entire proposal* is one of exceptional quality throughout. Simple as all outside, but, by George, it brings home the bacon.'

"And, by Jove, Sir, as somewhat of an authority on women, throroughbreds and whisky, I'd say that that line of attack would achieve results ninety-nine times out of a hundred."

*In the H & C Line you'll find an exceptionally fine register for every type of installation — See your H & C jobber.*

**HART & COOLEY MANUFACTURING CO.**

Warm Air Registers · Air Conditioning Grilles · Regulator Sets · Dampers · Chain

H & C

61 W. KINZIE ST. · CHICAGO · ILLINOIS

"YES SIR!
I USE ARMCO SHEET METALS
because they help me make more money"

MULTIPLY this sheet metal contractor several thousand times, and you have some idea of the number of shop-owners who regularly use Armco Sheet Metals. INGOT IRON is their first choice, of course—for its great uniformity, easy-working qualities, full-weight, adherent galvanized coating, rust-resistance, and widespread customer acceptance. Yet when less expensive metals must be used, they prefer copper-bearing and plain steel sheets made by the producers of INGOT IRON. They believe, and rightly so, that the same care, the same exacting standards of manufacture apply to all Armco sheets. The only difference is in the analysis, the composition. Your nearest Armco Distributor is ready to supply you top-quality Armco sheets—and even more, proved selling aids. The dollar-making advantages of dealing with an Armco Distributor are too inviting to overlook. Ask him to send his salesman in to see you before you order sheets or formed products again.

ARMCO

THE AMERICAN ROLLING MILL COMPANY
EXECUTIVE OFFICES • MIDDLETOWN, OHIO


# News Items . . . . . .

### Chain Store Conditioning Job

The Acme Roofing Co. of Montgomery, Ala., did the sheet metal and roofing work and also the duct work for the modern air conditioning system in the new store of J. J. Newberry Co. 5-7-9 Dexter Ave. formally opened July 24, 25, 26. It is one of 437 stores in the chain managed by Olin Friant who came here from Zanesville, Ohio. The store has 20,000 square feet of sales space, 15,000 feet of storage space, four display windows and a frontage of 80 feet, longest on Dexter Ave. Acme Roofing Co. has for its slogan "Results—Not Excuses." J. C. Burgess is manager. It has completed some of the largest roofing jobs this season in the capital city.

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### Texas Centennial To Use A. C.

Plans are being worked out for exhibits at the Texas Centennial Exposition, to open in Dallas June 6, 1936, which will depend largely upon air conditioning for their effectiveness. Air conditioning, according to Expositon officials, has become an ally of the successful exhibitor.

Following the lead of a Florida city which tied air conditioning into its Chicago exhibit most effectively, a number of localities are considering including a sample of the weather they have to offer in their community displays at Dallas. Whether the delightful temperature of an Alaskan summer or the stimulating, invigorating breeze of a mountain resort are wanted, modern air conditioning machinery is designed to fill the need.

Realizing that the condition of the air has much to do with the alertness of either a salesman, exhibit attendant, or a visitor, many firms are planning to include air conditioning as part of their display solely for the reason that their story will go over better and will be remembered longer by a comfortable visitor.

Although preliminary negotiations with exhibitors indicate that the Texas Centennial Exposition will be largely an air conditioned show, both through exhibits by air conditioning concerns and through the addition of air conditioning to major exhibits, the exhibit buildings of the Exposition will not be completely air cooled. They will be scientifically ventilated and various types of coolers will be used, but air conditioning of exhibits will be the privilege of the individual exhibitors.

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### Contractor Gets Large Skylight Job

J. J. Brislan contractor, of Frankfort, Ky., received award to repair broken skylights in the State Capitol on bid of $3,197.

◆

### F. H. A. Progress

A record week of over $4,000,000 in loans carried the Federal Housing Administration modernization credit volume well over the $100,000,000 mark the week ending July 20. Loans reported during the week numbered 12,690 for a total of $4,305,156, bringing the total issued since the start of the program to 259,234 loans amounting to $103,951,917.

The mortgage program was also active, there being 1,774 mortgages reported with appraisal fees paid for a total of $6,826,290 during the week. This brought the total to 27,726 mortgages for a total of $110,347,878.

To the building industry this business is adding profits which are improving the condition of business in general and giving reempoyment to thousands of building artisans throughout the nation.

◆

### American Oil Burner Assn. Takes New Name

At a two day meeting held in Cleveland, July 9th and 10th, attended by the key manufacturers in the oil burner industry and presided over by W. J. Smith, President of the AOBA, the creation of Oil Burner Institute to succeed AOBA and the adoption of a broad gauge program was unanimously voted.

# New Literature . . . .

**For your convenience in obtaining copies of new Literature, use the coupon on page 68.**

### 287—Furnace Cleaning Leaflet

Breuer Electric Manufacturing Company, 866 Blackhawk Street, Chicago, Illinois, announce a new leaflet describing the company's improved Tornado furnace and boiler cleaner. The folder contains a complete description of the improved unit together with illustrations and specifications of the standard equipment attachments.

◆

### 288—Air Conditioning Booklet

Air Conditioning Equipment Corporation, 310 West 33rd Street, Minneapolis, Minnesota, announce the compilation of a new loose-leaf leaflet presenting information on the entire line of air conditioning apparatus made by the company.

Included among the items are: blowers (both housed and unhoused); fan equipped cold air shoes for gravity systems; cold air boxes with filters; complete cleaning and circulating conditioning units; air conditioning units for use with steam, hot water or vapor installations; water cooling machines; smoke-pipe heat savers; cabinet and central system humidifiers.

◆

### 289—Air Conditioning Pictured

The increased use of air conditioning for human comfort and the strides made by this new industry even during unsettled business conditions is the subject of the August issue of the Copper & Brass Research Association's Bulletin. The entire publication is devoted to a panorama of air cooling installations in all classes of buildings.

◆

### 290—Insulation Pocket Catalog

More than 50 of the J-M insulating products, of which there is one for every temperature from 400 degrees below zero to 2,500 degrees Fahrenheit, are described and illustrated in a handy little booklet entitled "Barriers to Industrial Waste," which has just been published by Johns-Manville, 22 East Fortieth Street, New York City.

The table of recommendations for insulating materials in this booklet covers ovens and dryers, ceramic, refrigerating and brewery equipment, hot and cold pipes.

◆

### 291—Sheet Metal Working Machines

Niagara Machine and Tool Works, 637 Northland Avenue, Buffalo, New York, announce Bulletin No. 72-E covering the Niagara line of machines and tools for sheet metal working. The catalog describes the line of power squaring shears, from 30 to 72-inch inclusive cutting lengths and from 20 gage to ¼-inch capacities.

◆

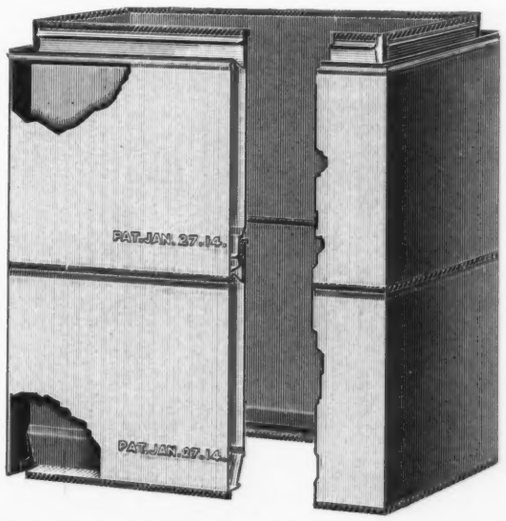
### 292—Book of Estimating Tables

A new book, "Jones' Estimating Tables," on air requirements and duct sizes for heating and air conditioning, is announced by Domestic Engineering Publications, 1900 Prairie Avenue, Chicago. The book sells for $2.00.

The purpose of the book is to eliminate much of the calculation connected with figuring air requirements and duct system sizes for forced air heating. In presenting the information the assumption is made that a temperature difference of 90, 80, 70 or 60 degrees will generally be used.

The first tables in the book present factors which are to be multiplied by the square feet of glass, exposed walls, ceiling, etc., to obtain the c.f.m. required. A 10 per cent safety factor is included in all tables. For infiltration, either the crackage method or cubic content method is presented in tabular form, requiring only the multiplication of the factor by the number of feet of cracks to obtain directly the c.f.m. Duct sizing tables range from 300 to 600 feet per minute velocity and for all c.f.m.'s ordinarily found in an average room.

**SHOP TALK**



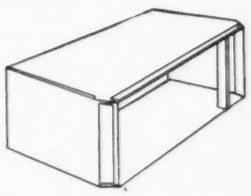

With the resumption of building Excelsior Self-locking Double Wall Stack again demands your consideration.

One of the oldest lines on the market, it has been constantly improved in design and construction and for years has represented the highest grade stack it is possible to produce.

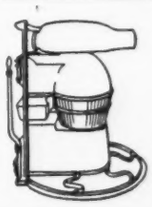
Be sure you use Excelsior Double Wall Stack on every installation requiring ducts in the partitions.

Check the coupon below for catalogs and prices.

**SQUARE FORCED AIR PIPE AND FITTINGS**



The new line of rectangular ducts and fittings has many features that will appeal to progressive dealers. Standardized fittings enable branches to be taken from trunk lines in any desired direction either below or between joists. Dividing the trunk its full depth for every branch insures uniform distribution of air regardless of volume or velocity. This improved line is fully illustrated in our regular Furnace Pipe catalog. Be sure you have your copy.



**CAST FURNACES**

Excelsior offers three models of cast Furnaces, each the highest in its own class. The new Era, equipped with Duplex grate, one-piece radiator, slip-on fronts and upright shaker is probably the most outstanding bargain on the market today.

The Excelsior Famous and Ace are in a higher class, the latter representing the most efficient type of design and construction. It is easily the most efficient for use in Air-Conditioning and Forced-Air systems.

**The EXCELSIOR STEEL FURNACE CO.**
**114-118 South Clinton St. Chicago, Ill.**

Please send information on items checked. No obligation, of course.

☐ Cast Furnaces ☐ Furnace Pipe ☐ Blowers, Accessories
☐ Steel Furnaces ☐ Forced-Air Ducts ☐ Stove Pipe and Elbows

Name .....

Address .....

.....

# FAULTLESS HEATER CORPORATION

SUCCESSOR TO THE GRAFF FURNACE CO.

CLEVELAND, OHIO

manufacturer of

## FAULTLESS FURNACES

ALSO

## FURNACE REPAIR PARTS

from the original Graff patterns for

FAULTLESS — COMFORT
FAULTLESS-COMFORT — CAPITAL
LACKAWANNA — PHILADELPHIA
RIVAL — and other Graff Furnaces

The following Supply Houses carry a stock of these Repair Parts made from our original patterns:

DETROIT, MICH.
Detroit Stove & Fce. Repair Co.
Star Steel Supply Co.
ELMIRA, N. Y.
C. A. Miller & Co.
BRIDGEPORT, CONN.
Lipnick Stove Repair Co.
SPRINGFIELD, MASS.
The Burden-Bryant Co.
PHILADELPHIA, PA.
Aetna Stove Co., Inc.
Central Stove Repair & Fdy. Co.
Standard Stove Repair Co.
United Stove Repair Co.
Weinstein Supply Co.
M. Stein
WASHINGTON, D. C.
Fries, Beall & Sharp Co.
NEWARK, N. J.
Eselgroth & Co.
ALLENTOWN, PA.
Pennsylvania Supply & Mfg. Co.
SCRANTON, PA.
Samuel Weinberg & Sons, Inc.
BOSTON, MASS.
Huse & Carleton, Inc.
Henry N. Clark Co.
Waverly Htg. Supply Co.
MILWAUKEE, WIS.
The Speich Company
CHICAGO, ILL.
Associated Heater Parts Co.
YOUNGSTOWN, OHIO
Banner Repair Parts Co.
ROCHESTER, N. Y.
Henry Siebert Sons, Inc.
PITTSBURGH, PA.
The Graff Company
A. H. Johnson Co.
Shamblen Furnace Parts Co.
WILKES-BARRE, PA.
White Hardware Co.
Wilkes-Barre Hdw. & Stove Co.
BALTIMORE, MD.
George J. Thaler, Inc.
BUFFALO, N. Y.
O. G. & D. H. Donaldson Co.
Minet Heating & Supply Co.
NEW HAVEN, CONN.
New Haven Stove Repair Co.
SHAMOKIN, PA.
Geo. B. Kelser
NEW BRUNSWICK, N. J.
New Brunswick Stove Co.
WILLIAMSPORT, PA.
Neyhart's, Inc.

These Supply Houses can give you prompt service.



# WHITNEY No. 91 PUNCH

**PUNCHES**
**Angle Iron**
2½ x 2½ x
¼ inches

**PUNCHES**
**Channel Iron**
2½ inch Flange x ¼ inch Web

**CAPACITY**

⅝ Inch Hole Through ¾ Inch Iron
1 Inch Hole Through ⅞ Inch Iron
2 Inch Hole Through ⅛ Inch Iron

Weight ..... 82 pounds
Depth of Throat ..... 5 inches
Stock Size of Punches ..... ⅛ inch to 2 inches

**Bolster Plates Are Made in Four Sizes**

⅞ inch Bolster for Angles and Channels and all holes up to ⅝ inch.
1 3/16 inch Bolster for holes from 11/16 inch to ⅞ inch.
1 11/16 inch Bolster for holes from 13/16 inch to 1½ inches.
2 7/16 inch Bolster for holes from 1 5/16 inch to 2 inches.

**Size of Bolster Denotes Outside Diameter of Dies**

W. A. WHITNEY MFG. CO.
636 RACE ST. ROCKFORD, ILL.


# New Literature . . . .

**For your convenience in obtaining copies of new Literature, use the coupon on page 68.**

### 293—Window Ventilators

A box-type window ventilator, consisting of filters and fan with adjustable directional flow louvres, is announced in a leaflet recently published by Amirton Company, Inc., 49 East 21st Street, New York City.

The leaflet gives full information on the four sizes of ventilators manufactured and shows typical applications.

◆

### Lewis' New Air Conditioning for Comfort

(277 + vii pages and large psychrometric chart—cloth-bound—5½×8½ in.—Price $2.50 postpaid—Published by Keeney Publishing Company, 6 North Michigan Avenue, Chicago, Illinois.)

"Lewis' New Air Conditioning for Comfort," by Samuel R. Lewis, is a completely rewritten and enlarged edition of the "Air Conditioning for Comfort" published in 1932. It embodies the experience resulting from use of the earlier edition in almost daily practice and by students in many schools. It will be found valuable as a text for school and home study use as well as a reference for the contractor, engineer, architect, or owner.

In this improved, second edition, the record sheets for the computation of the heating and cooling loads for residences and commercial buildings are new and have been simplified. Two chapters not included in the first edition explain in detail the design of a year 'round air conditioning system for an office building, which includes banking space, offices, stores, restaurant, cocktail lounge, and kitchen. The necessary computations are given in their entirety in the explanation of the design procedure. Similarly, two re-written chapters cover the design of a year 'round residence air conditioning system, with complete computation, record sheets to simplify the various steps, and the necessary tables and charts.

Chapter 1 defines the terms used in air conditioning, and in Chapter 2 types of air conditioning systems and equipment are described. Chapter 3 explains the psychrometric chart and table and its use, and in Chapter 4 formulas and methods of computation are presented; in this chapter eighteen different computations encountered in air conditioning design work are explained and examples are given. Chapter 5 takes up humidifying and dehumidifying, with descriptions of methods and equipment which include numerous typical examples. In Chapter 6, refrigeration for air conditioning (including water vapor) is covered.

Chapter 7 discusses air conditioning and the human body, comfort, and health, with data and curves based on the work of the American Society of Heating and Ventilating Engineers, including the comfort chart. Chapter 8, on heat transmission through buildings, includes tables of design temperatures for both heating and cooling, and ten full-page plates of coefficients of heat transmission through various types of building construction.

In Chapter 9, information and tables on heat from the sun and appliances are given and the effect of heat gain from these sources on the cooling load is discussed. Chapter 10 considers design air volumes, infiltration and ventilation and Chapter 11 is devoted to air distribution within rooms and duct design and layout; this chapter (one of the most important, as the success of an air conditioning installation depends upon the air distribution) includes many tables and examples. Chapter 12 covers water circulation in heating and cooling systems, with examples of the design of piping for air conditioning installations.

Chapter 13, a new one, explains the estimation of operating costs and includes a curve of operating hours for cooling plants based on design wet bulb temperature. The last four chapters of the book (Chapters 14-17) are devoted to the detailed design of year 'round air conditioning systems for a residence, and for a commercial building, as mentioned.

**The U. S. Government Reports From All Over The Country Show That Building Construction And Repair Is Reaching New "Highs" Every Week!**

—also lumber and building supply firms add their evidence.

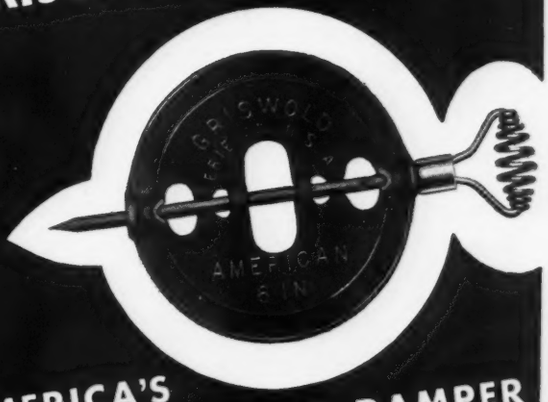
The conclusion is obvious: YOU are going to do more business this fall than in several seasons—and you are going to have increased need for

# HANDY PIPE

HANDY pipe was best "B.D." (before depression); it was best "D.D." (during depression) and it is best "A.D." It was—and still is—"made to outlast the buildings it goes into."

**F. MEYER & BRO. CO.**
**PEORIA ILLINOIS**

**GRISWOLD "AMERICAN"**



**AMERICA'S LARGEST SELLING DAMPER**

GRISWOLD

*Assures Easier . . . Quicker Immediate Installations*

TAKE the Dam out of Damper jobs, with the Griswold "American." It's the only damper that gives you all these time-saving . . . temper-soothing features.

"Original Steel Spindle" easily pierces any stovepipe with a hole the size of the spindle. The hump on the spindle locks the damper in place. The nickel coil keeps the handle cool as a cucumber. Thru the "Original Reversible" plate, the spindle is quickly inserted from either side. The special nickel-finished steel ferrule, enclosing the spring, protects it from heat, adds extra years of service. To save you from the muss of shavings or straw, Griswold Dampers are packed in improved cartons (shown below) with contents plainly stenciled on both ends. The complete Griswold "American" line includes: Regular Sizes 3" to 7", Furnace Dampers, 8" to 18", Oval Dampers, 4" to 8".

Don't waste time on inferior dampers. Specify Griswold "American," manufactured and guaranteed by The Griswold Mfg. Co. of Erie, Penna.

*Original Reversible*
*Original Steel Spindle*

**Save Time... Bother... Space ORDER IN NEW HANDY CARTONS**

FOR YOUR CONVENIENCE

American Artisan, 6 N. Michigan Ave.,
Chicago, Ill.

Please ask the manufacturer to send me more information about the equipment mentioned under the following reference numbers in "New Products" and "New Literature." (Check numbers in which you are interested):

| | | | | | |
|---|---|---|---|---|---|
| 175 | 176 | 177 | 178 | 179 | 180 |
| 181 | 182 | 183 | 184 | 185 | |
| 186 | 187 | | | | |
| 287 | 288 | 289 | 290 | 291 | |
| 292 | 293 | | | | |

Name ..... Title .....

Company .....

Address .....

# With the Manufacturers . . . .

### Inland Steel Appoints C. R. Robinson

Inland Steel Company, Chicago, announce the appointment of Charles R. Robinson, as First Vice President and General Manager of Sales. Mr. Robinson succeeds Edward M. Adams, who died on May 8th.

◆

### Allsteel Appoints Distributor

The Allsteel Press Co., 12015 S. Peoria St., Chicago, makers of the Verson Allsteel line of punch presses and press brakes, have appointed Mechanical Equipment Sales Co., 416 Chamber of Commerce Bldg., Cincinnati, Ohio, exclusive representatives in the Cincinnati district.

### Penn Electric Names New Officers

Penn Electric Switch Co., Des Moines, Iowa, announces the appointment of Nelson B. Delavan and Ben L. Boalt as vice presidents, effective immediately. Nelson B. Delavan, who has been sales manager of the Penn Electric Switch Co. for the last five years, was named vice president and director of sales. Ben L. Boalt, who has been in charge of heat control sales for the Penn Electric Switch Co. for the last four years, was named vice president in charge of the heat control division.

Nelson B. Delavan announced the naming of K. W. Cash, as advertising manager and sales promotion director of that firm, effective July 1.

The company announces the removal of its New York office from 33 West 60th Street to 15 Laight Street, July 22.

◆

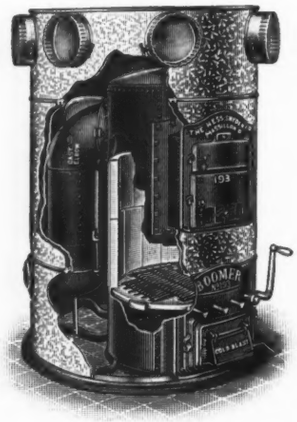
### A. W. Glessner Celebrates Golden Wedding

A. W. Glessner, president of The Excelsior Steel Furnace Co., Chicago, and wife celebrated their golden wedding anniversary at Haddon Hall, Atlantic City, N. J. on Sunday, July 21st. In addition to being a factor in the warm air industry for more than fifty-four years, Mr. Glessner is a newpaper man, having edited the Galena, Ill. Gazette for nearly forty years. This publication celebrated its one hundredth anniversary last November.

◆

### Dail Announces Representatives

Dail Steel Products Company announce the appointment of the Vance-McCrea Sales Company, W. 27th and Sisson Streets, Baltimore, Maryland, covering the entire state of Maryland. Jos. H. Oates, 154 South Main Street, Providence, Rhode Island, has been appointed district sales representative working under the direction of Jos. G. Stalb, Eastern District Sales Director.

**Boomer Boiler Plate Furnaces**

*Also made with duplex grates and upright shaker.*

Have been successfully made for 22 years. Where introduced have given satisfactory service. The fire pot liners are the best we can buy and we know of several Boomers that still have the original liners in, which are 22 years old. We have been making cast iron Boomers for 50 years.

If you are interested in selling a strictly high grade furnace, ask for prices and agency.

Nothing but the best of material enters into the making of Boomers.

When repairs are needed, avoid risk of dissatisfaction by ordering direct from the original patterns. Prices are low.

*We sell to legitimate dealers only.*

**THE HESS-SNYDER CO., MFRS.**
Massillon, Ohio

**NOW IS THE TIME**
**TO GET STARTED**
**CLEANING FURNACES BY VACUUM**

The biggest profits of the year are right ahead of you and you can easily pay for this powerful unit out of your extra profits in the next few months.

We have MANY LETTERS similar to the following:

Brazil, Ind. Feb. 15, 1934.

Dear Sir:

If it hadn't been for our Grand Rapids Furnace Cleaner I wouldn't have had one-third time of work during the past year. There isn't any season for one, I use mine all the time, summer, fall and winter. I tried other cleaners and sent them back. If anyone wants to write me about it I surely would like to tell them about the Grand Rapids Furnace Cleaner.

Yours truly,
CLIFFORD HUMBLE.

**With the machine you get "A Plan to Increase Your Sales" that works — Convenient terms — Free trial — With no strings attached — ALL AT OUR NEW LOW PRICE.**

*Write for details*

**GRAND RAPIDS FURNACE CLEANER COMPANY**
**Grand Rapids, Michigan**

# ANOTHER RYBOLT FURNACE PROVEN!

This New Rybolt Furnace is a stand-out—the most advanced on today's market. No sharp curves to hamper the flow of warm air to its proper destination . . . one-piece radiator with smoke and clean-out collars cast on . . . dust-proof . . . it is practically a streamlined heating system.

Every Rybolt furnace installation gives efficient, economical and trouble-free service for years. You, as a dealer, can appreciate that this proven fact will develop many staunch customers for you . . . as a successful furnace installation will make a happy customer and a happy customer will send you additional business. Rybolt has proven its success in the field. Investigate . . . and get in line with the Rybolt line.

**THE RYBOLT HEATER COMPANY**
Ashland Ohio

## Simply Plug This 7 in 1 Machine Into a Light Socket for

Single Beading O. G. Beading Slitting
Wiring Turning Burring Crimping

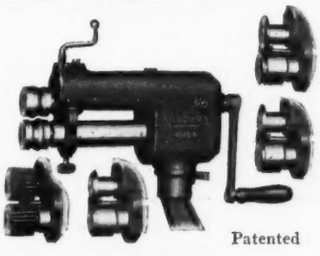
**Interchangeable steel rolls and electric drive make this No. 172 Niagara Electric Combination Machine do seven different operations, and do them in a hurry. Send coupon for bulletin.**

Patented

No. 172 Elec. Comb. Machine

*Hand Operated No. 164 Universal Combination*

No. 164 Universal Rotary Combination hand operated for burring, turning, wiring, crimping, beading.



Patented

NIAGARA

**Mail this Coupon for Facts on Niagara Money Makers**

NIAGARA MACHINE & TOOL WORKS AA8
Buffalo, N. Y.

Please send data on ☐ No. 172 Elec. Comb. Machine. ☐ No. 164 Universal Combination.

☐ Folders—Brakes ☐ Shears; Squaring, Rotary
☐ Groovers—Seamers ☐ Lever Shears and Punches
☐ Slip Roll Formers ☐ Snips—Stakes—Hand Tools

Name .....

Street .....City.....

## Blow Pipe Velocities

(*Continued from page 20*)

types of materials. Note that the speeds developed are those which maintain suspension. Faster velocities are always used to compensate for voids, bad fittings, long travel, etc.

The tests were run with screened cinders, crushed carbon, anthracite coal and crushed quartz—the specific gravities ranging from 1.08 to 2.65 as explained previously. In order to get a comprehensive test, five sizes of each material were used because size and shape of particles transported have an important bearing on the velocity required for suspension. Sizes ranged from those particles 0.320 inches in diameter to particles 0.055 inches in diameter.

Testing apparatus consisted of a horizontal duct 16 feet long and a vertical duct 13 feet long. Materials were introduced through a hopper and tube into the duct thus getting results on the negative side of the fan. Tests showed that there is practically no difference in effect on negative or positive sides of a fan. Velocities were determined by a Pitot tube mounted in the mid-section of the duct system. One fact shown by the tests was that critical velocities are more pronounced in vertical than in horizontal ducts.

The general results obtained are shown in the two charts—one for horizontal ducts and the other for vertical ducts. By way of explanation it may be said that the four sloping lines indicate suspension velocities for the four different weighted materials used, also that the larger the particles, the higher the required velocity.

The results may be expressed mathematically as follows. For vertical ducts—

$$\text{velocity} = 13300 \left(\frac{S}{S \times 1}\right) d^{0.570}$$

in which 13300 is a constant which is some function of the specific gravity of the materials conveyed and is developed from the equation:

$$\text{constant} = \frac{S}{S \times 1} k$$

in which S equals the specific gravity of the material and k is a constant.

The velocity required for horizontal ducts is expressed by the equation—

$$\text{velocity} = 6000 \left(\frac{S}{S \times 1}\right) d^{0.398}$$

In both equations velocity is in feet per minute and diameter (d) is in inches. Attention is called to the difference in velocities required for horizontal as against vertical transport as shown on the two diagrams. The larger margins between curves on the horizontal duct chart are due to the fact that in horizontal transport larger particles tend to drop to the bottom of the duct and slide along rather than float in suspension.

Between the limits of the weights of the four materials tested these two charts serve as a ready reference for minimum velocities required for transport of materials. To these minimum velocities should be added additional velocity to compensate for long runs, bad fittings and other contingencies.


**BRILLION**
**WARM AIR FURNACES**

**No. 100 Series**

The 100 Series is a pipe furnace of two-piece radiator construction of the horseshoe type or two way travel. Radiator is convertible so that smoke pipe can be taken out at any convenient point. Casings can be furnished lined or unlined as an extra. Write for complete construction details.

**Brillion offers the dealer a line of furnaces which makes for customer satisfaction and dealer profits. Guaranteed . . . embodies all modern improvements . . . efficient in operation . . . economical in fuel consumption . . . durable . . . long service. Go after business with Brillion quality and performance to back you up. Get our dealer proposition.**

*Write Now For Catalog*

**BRILLION FURNACE COMPANY**
**BRILLION, WISCONSIN**

**FIRELINE**

*SELL where you could never sell before . . . Make WAGES you never could make!*

**A New Discovery**
**Gives More Heat—Saves Fuel**
**Seals Cracks—Reduces Soot & Ash**

**Increases Heat Capacity and Combustion Efficiency**

FIRELINE greatly increases the efficiency of a furnace by raising combustion temperature — burning all burnable fuel and minimizing smoke, soot, gas and ash.

**Repairs Burned-out Pots**

FIRELINE is a new type plastic refractory material that conforms to any shape and fuses into a tough non-cracking mold. It permanently repairs cracked or broken firebowls at low cost and high profit.

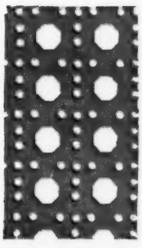
**1 out of every 3 furnace firebowls are burned-out, still not one out of twenty homeowners will buy a new firepot today. However, all are interested in cutting their coal bills, in getting more heat, less ash and eliminating smoke, soot and furnace gas —are interested in FIRELINE and are *buying* FIRELINE, as quantity *repeat* orders from furnace men prove. FIRELINE is your big opportunity for volume sales and profit. You can sell it where you could never sell before, right down the street for furnaces of every make and model. You can install it in less time than is required to take down a furnace, and can make $10 an hour on your labor. You can do all this and at the same time give your customers more for their money than they have ever had. It's the thing today—a thing you should know about.**

(Copr., 1935, Fireline Stove Lining Co.)

*Write for Full Information*

**FIRELINE STOVE & FURNACE LINING CO.**
**1166-H Clay Street, Chicago, U. S. A.**

# PERFORATED METALS



Screens for Grains, Minerals, Food Products or any material to be graded or screened.

Safety Guard Accessories, including perforated sheets, angles, bands, etc.

Architectural Grilles in many designs. Special patterns and sizes to suit your individual requirements.

Stainless Steel—Brass—Bronze—Copper—Monel—Aluminum—Zinc—or any other metal or sheet material perforated as wanted.

The Harrington & King PERFORATING CO.

5649 Fillmore St., Chicago, Ill. New York Office, 1114 Liberty St.

VERNALLOY WEARS!

Only Vernois Furnaces are completely cast of Vernalloy . . . the metal that has a proven life 1½ times that of ordinary cast iron. It is also a distinct selling point that the Series 900 Furnace is of much heavier construction than any other furnace of its type. It is a sales builder and profit producer.

Write for complete details and investigate the Mt. Vernon easy payment plan . . . 3 years to pay at the low FHA interest rates.

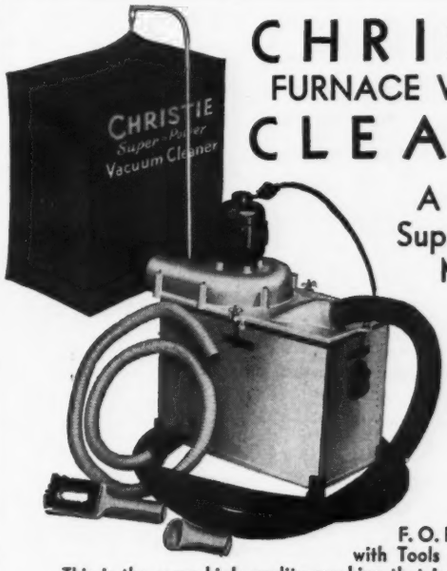
MT. VERNON FURNACE AND MANUFACTURING COMPANY
Mt. Vernon Illinois

WARM AIR FURNACES
FURNACE FITTINGS
FURNACE PIPE
REGISTERS
FILTERS
FANS
BLOWERS
CONTROLS

A DEPENDABLE SOURCE OF SUPPLY

THE J. M. & L. A. OSBORN Co
Manufacturers—Distributors
DETROIT-CLEVELAND-BUFFALO

CHRISTIE FURNACE VACUUM CLEANER




A One-Man Super Powered Machine

$99.50

Subject to Change Without Notice

F. O. B. Cincinnati with Tools and Attachments.

This is the same high quality machine that is known to furnace dealers everywhere as the most powerful, one-man cleaner on the market. Built by practical furnace men.

Quantity production and large purchasing power enable us to make this sensationally low price. Includes tools and attachments. Folder "A" mailed upon request.

We also manufacture the "Christie Giant" to operate from truck or yard.

Sold by Jobbers and Furnace Manufacturers. Write for names of those in your territory.

CHRISTIE CLEANER COMPANY
*Division of* The Cincinnati Sheet Metal & Roofing Co.
226-30 East Front St. Cincinnati, Ohio
Salesmen: A few choice territories still open.

## Baffling Practices

(*Continued from page* 19)

aim is to get uniform temperatures all around the bonnet or plenum. We use a box section baffle with closed in bottom and top and a number of small holes in both bottom and top to permit flow of air through the baffle. The back baffles as shown in Fig. 2 on short radiators are triangular. With a large wrap-around radiator we make the baffle circular as shown in Fig. 2A. The space left open after the baffle is applied is calculated to give the same area as the total warm air leader take-off."

### NUMBER 3

**E. H. Carr, Mid-West Heating Co., Indianapolis, Ind.**

"For steel furnaces with short radiators we make a corner, circular face type of baffle for the four corners as shown in Fig. 3 and 3A. The baffle is fastened to the casing with metal screws or bolts. We leave open a space equal to the warm air take-off. As shown in Fig. 3A the baffle is closed top and bottom and extends from the level of the top of the radiator or drum to the grate level. We cut the front pair off before reaching the line of the feed pouch and ash door. On our furnace this usually means a box 30 inches from top to bottom. We make the baffle of black iron. In some cases we leave the top open."

### NUMBER 4A

**Fox Furnace Co., Elyria, O.**

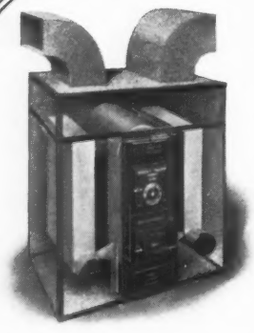
Rectangular Sunbeam steel furnaces with blower attached employ the same style of baffling as recommended for conversion jobs. The radiator and drum are enclosed on three sides with a double walled baffle which runs from one side of the door frame around to the other frame edge. The baffle is sharp bent to give angular rather than circular contours. No attempt is made, to carry the baffle into the space between the drum and the end of the radiator other than as shown in Fig. 4A. The outer wall is galvanized iron, the inner wall is black iron. The galvanized iron sheet extends from the floor to the top of the heating compartment. The black iron lining starts at the grate level and stops a few inches below the top of the heating compartment. Both sheets are cut through for blower application.

## Ohio Convention

(*Continued from page* 26)

per by A. C. Schreiner, Republic Steel Corporation. Mr. Schreiner cited some of the fields of application, such as bars, sinks, metal trim, all sorts of utensils, apparatus and vats for industries. The speaker pointed out that the small contractor with the average machines and tools can undertake the fabrication of many small stainless steel products and items. Larger contractors with power equipment are in an excellent position to do the larger type of stainless steel work, such as store fronts, store trim, architectual embellishment, etc. The speaker devoted considerable time to an analysis of the various types of stainless steels now available. The speaker pointed out that continual improvement has been made giving better drawing, forming, shearing, soldering and welding characteristics so that today the contractor need not fear undertaking any type of job if he will inform the jobber or mill as to the special requirements of the work.

C. L. Moseley, district manager

*To the Furnace Dealer—*

*who is satisfied with his present line*

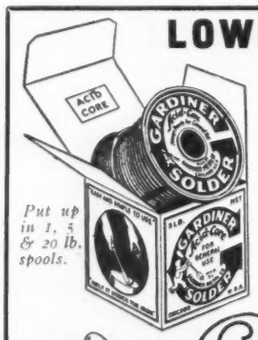
Modern Hearth Furnaces are a good addition to any good furnace line. They give you an advantage over competition, by offering features found in no other furnace. They satisfy customers on the "fuel-fence." The radically new Square Interior is designed for Gas as well as Coal—and with the TWO-FUEL FEATURE can be changed from gas to coal and back again by simply moving a lever. Solidly built of all steel—adaptable to use with all Air Conditioning Systems, oil burners or automatic stokers—easy to sell—easy to assemble. WRITE TODAY.

MODERN HEARTH FURNACES

THE THOMPSON MANUFACTURING COMPANY

30TH. & LARIMER STS. SINCE 1878 DENVER, COLO.

LOWER PRODUCTION COSTS




*Put up in 1, 5 & 20 lb. spools.*

are made possible by the use of Gardiner Flux-Filled Solder. Its uniform high quality and perfect flux save time and material. Both expert mechanics and inexperienced help can do faster and better work.

Due to modern production methods Gardiner Solder sells for less than ordinary solders.

We also make high quality bar, solid wire solders and babbitts.

Gardiner METAL CO.

4831 So. Campbell Ave., Chicago, Ill.

FURNACE REPAIR PARTS CHART

To help you order the correct part National has inserted in every catalog a chart of representative furnace parts. Each part is designated by name and symbol letter—no mistakes.

You now have the picture as well as price and furnace number to help you. Save time and money. Get one free.

NATIONAL FOUNDRY & FURNACE CO.

STATION "B" . . . . . DAYTON, OHIO

# HESS FURNACE AIR CONDITIONER BLOWER FILTER UNIT

## HESS EQUIPMENT

Is distinctively superior, in design, appearance, quality and performance, to ordinary equipment and is easier to sell at attractive prices.

## HESS FINANCE PLAN

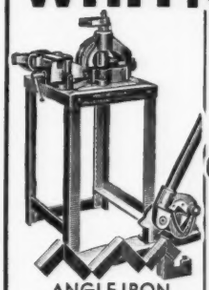
Low F. H. A. rates, 5% per year.
No Down Payment.
Up to 36 months to pay.
Payment may start 45 days after installation.
Dealer paid in full on completion without recourse or hold back.

Write today for full details.

***WRITE FOR DEALER PORTFOLIO***
HESS WARMING & VENTILATING CO.
1211-27 S. WESTERN AVE., Founded 1873
CHICAGO, ILLINOIS

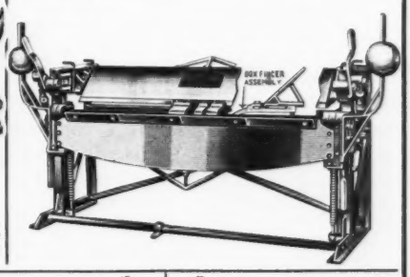


# WHITNEY TOOLS FOR THE SHEET METAL MAN

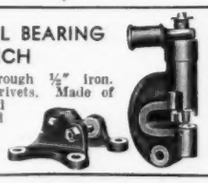


ANGLE IRON MACHINERY
A complete unit for working angle iron including shear, mitre notcher and bender.

WHITNEY JENSEN
Combination Bending and Box Brake. Has 17 distinctive points of superiority. Send for descriptive literature.

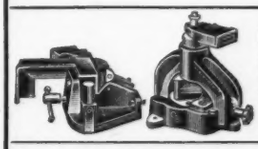


NO. 20 BALL BEARING PUNCH
Capacity ½" through ½" iron. Will also drive rivets. Made of alloy steel and heat treated throughout.



BALL BEARING PUNCHES
A complete line of all sizes with a complete range of sizes in punches and dies.

SCRATCH PINS



ANGLE MITRE NOTCHER AND ANGLE IRON BENDER. Capacity 2"x2"x¼". A pair of tools that every shop ought to have. They are Nos. 50-51 in our catalogue.

Rivets, Punches and Dies
A complete line. Write us regarding any problem you may have with regard to tools.

**WHITNEY METAL TOOL CO.**
91 FORBES STREET, ROCKFORD, ILLINOIS



# VIKING SHEARS

*They've got what it takes!*

● When you need shears, always get a Viking. This tool is designed for power and speed and accuracy. And how it delivers!

The cut is true and clean—less wasted material, less time to a job—and a shear that stays with you year after year doing the same perfect work as the day they left the Viking factory.

*Send today for complete information.*

**VIKING SHEARS**
**VIKING SHEAR COMPANY, Erie, Pa.**



## Sell Furnace Repairs and Make Money

**with Breuer's Ball Bearing**

# TORNADO

**Furnace Cleaning Service**

The TORNADO gets you into the basement where it is easy to sell repairs and new furnaces. And you make a profit on the cleaning job too. Hundreds of dealers say the TORNADO increased business beyond all expectations. We'll send you on request the name and statement of a dealer near you to prove our claims.

The TORNADO is the most powerful furnace cleaner built. Complete with 10 necessary attachments. Low price—easy payments—free trial. Approved by Anthracite Institute and Underwriters Lab. Write for complete information on a real money maker.

**BREUER ELECTRIC MFG. CO.**
865 Blackhawk Street, Chicago, Ill.

of the Chase Brass and Copper Company, presented a discussion of problems of copper covering expansion and contraction of copper and the proper methods of taking care of these changes in lengths by the proper use of expansion joints, seaming, locking and cleating.

The concluding address of the convention was given by F. L. Myers, chairman of the convention committee, National Warm Air Heating and Air Conditioning Association. Mr. Myers declared that, very frankly, he believed that associations and convention committees must do something to improve the general attendance at conventions. The speaker pointed out that the exhibitors had spent from one or two to several hundreds of dollars to arrange and staff their displays. The only way these manufacturers, who definitely contribute to the success of any convention, can obtain satisfactory results from the money expended is for the associations to bring the conventions a large number of contractors.

Mr. Myers explained the operation of the National Warm Air Heating and Air Conditioning Association convention committee and pointed out that this committee or one of its three branches is now undertaking the compilation of information, cataloging of speakers and the preparation of ideas to be submitted to local and state associations to improve the general quality of the programs.

## Swanda Bros.

(*Continued from page* 18)

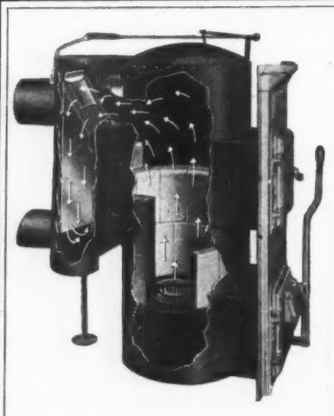
tells us not only what the customer buys, but how best to contact him, and when. Every time we learn something new about a customer, we record that on his card."

### Monthly Bills

Periodically, on the first of the month when regular statements go out, the firm makes out statements for all regular customers who have bought nothing from the company during the past two or three months and who owe the firm nothing. The statement is made out in the usual way, except that where the amount due should be, there are zeros.

Below that is a paragraph written in by one of the owners, to the effect that the customer owes the company nothing but that its owners wished he did; or that he has not been in recently and that he was missed—any paragraph aimed at making the customer feel that the company appreciates his business and that his patronage during the past couple of months was missed.

"This is a simple little idea, but we find it the best single direct mail advertising stunt we have ever used," Mr. Swanda declares. "First of all, we are certain of a reading of the advertising message, because the customer knows or believes strongly that he owes us nothing. When he sees a statement coming to him on the first of the month, he naturally wonders why. He opens it at once for an explanation. Being curious to see what is on the statement, he reads every word of the brief message thereon. He is relieved to see that he doesn't owe us anything, after all, and the message leaves him in a pleasant frame of mind."

HERE IS THE **NEW STEEL FURNACE**

**Bearing an old familiar name**

**FAULTLESS**

**This powerful heater is designed for the modern home, whether gravity heated or air-conditioned.**

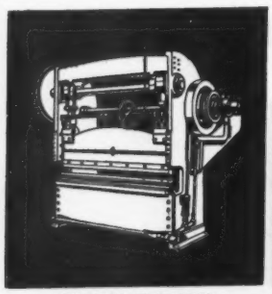
**It upholds the reputation of its companion, the Faultless All-Cast furnace, and completes a well-known line that now enables you to meet varied conditions.**

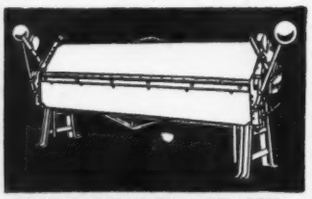
***Your request for circulars and prices will bring you some interesting information***

**FAULTLESS HEATER CORPORATION**

**1220 MAIN AVE.** **Successor to the Graff Furnace Co.** **CLEVELAND, OHIO**

**CHICAGO**





**PRESS BRAKE** **HAND BENDING BRAKE**

***Steel Brakes—Presses—Shears***

**DREIS & KRUMP MFG. CO.**

**7404 LOOMIS BLVD.** **CHICAGO**

ALL REPAIR PARTS for FURNACES BOILERS STOVES RANGES

**A.G.BRAUER SUPPLY COMPANY**

316 NO. THIRD ST. + SAINT LOUIS

IN STOCK • READY FOR IMMEDIATE SHIPMENT

**IN STOCK**

1,000,000 Pounds Furnace Repairs
Pots Grates Feed Sections
1,000,000 Pounds Stove Repairs
Oil Stove Repair Parts & Wicks

*Fast, Accurate Shipments*

**METZNER STOVE REPAIR COMPANY**
EST. 1880
515 Wyandotte Kansas City, Mo.

# RYERSON

IMMEDIATE SHIPMENT FROM STOCK

More than twenty kinds of prime quality sheets are carried in stock. There is a special sheet for every purpose. Also Bars, Angles, Rivets, Bolts, Tools and Metal-Working Machinery.

*Write for Journal and Stock List*

JOSEPH T. RYERSON & SON INC.

CHICAGO DETROIT MILWAUKEE ST. LOUIS JERSEY CITY CINCINNATI BUFFALO CLEVELAND PHILADELPHIA BOSTON

# SHEETS

"OAKLAND" *and* "Z-RO-KING" FURNACES

OAKLAND FOUNDRY CO.
Belleville, Ill.

# BETTER RESULTS

WITH WALSH ASBESTOS FURNACE CEMENT

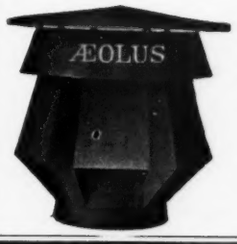
•

Use Walsh Asbestos Furnace Cement for certain and satisfactory results on all installation and repair work.

WALSH REFRACTORIES CORP.
*Producers of High Grade Refractories for 50 years*
4430 North First Street, St. Louis, Mo.

Walsh Asbestos Furnace Cement is furnished in 1, 2, 3, 5, 8 and 10 lb. cans; 25, 50, 100, 250, 500 lb. steel drums.
We also manufacture Furnace Tile and Fire Brick.

*Install* ÆOLUS *Improved* VENTILATORS




FOR industrial buildings, schools, homes, theaters, etc. Made in 14 different metals. Constant ventilation—no noise—no upkeep.

ÆOLUS DICKINSON
Industrial Division of Paul Dickinson, Inc.
3332-52 South Artesian Avenue
Chicago, Ill.

KEEP OLD MAN WINTER ON THE RUN
XX^TH CENTURY HEATING & VENTILATING CO.
AKRON, OHIO

• YOU CAN BEND IT AT THE WELD IF IT'S

# HOBART "Simplified" ARC WELDED

With this new Hobart 75 Ampere Arc Welder, designed especially for sheet metal shops, you can weld 24 gauge metal and heavier. A trial of this remarkable outfit will surprise you with the numerous cost saving jobs it will perform. It lets you arc weld work, formerly considered impractical, at savings in time and labor. Write today for details, astonishing low price, 30 Day Trial Offer and booklet on "Many Profitable Uses of Simplified Arc Welding"—no obligation.

HOBART BROTHERS Box AR 85 TROY, OHIO

BOOK ON ARC WELDING SENT ON REQUEST

# THE NEW PEERLESS 1935-FURNACE REPAIR CATALOGUE

• Now in the hands of the printer . . . will be ready very shortly.

SEND FOR YOUR COPY NOW!

FIRM NAME .....
ADDRESS .....
CITY ..... STATE .....
REQUESTED BY .....

PEERLESS FOUNDRY CO., INDIANAPOLIS, INDIANA

## Weather Protection

(*Continued from page* 16)

sheet connects at standing seams or battens as do the other roof sheets.

In Fig. 10 where the chimney cuts through two or more battens the pan sheets should be cut off at H and M as described in Fig. 9 and the space between H and M and between battens or seams A-A and B-B is filled with sheets lapped and soldered together. These sheets may form the base flashing around the chimney and make the collar described for Fig. 2. The sheet at H and M is double locked to the pan sheets. Note that the battens or seams at H and M are cut off and must be finished as they would at an eave or ridge.

In Fig. 11 where the chimney stands in a valley and in Fig. 12 where the chimney stands in a valley close to the gutter the battens or standing seams are cut off as shown and finished off as at an eave. A cricket is used for the two top sides of chimney and is constructed as explained for Fig. 7. The small sheets forming the widened valley around the chimney are soldered into a single piece, turned up to form a collar on the two lower sides of the chimney as explained for Fig. 2. The cap flashing on all four sides of the chimney is stepped as described before. All connections should be double locked.

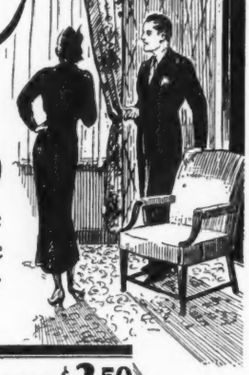

The Big Name in
HEATING
and AIR CONDITIONING
is
MUELLER-MILWAUKEE

When in Buffalo

Enjoy the quiet of a fine hotel centrally located to the business district yet away from downtown din. Meals that long remain a pleasant memory. Rooms that encourage rest. Single—$1.50 to $3.00. Double—$2.50 to $5.00. Suites—$5.00 and up. Write for descriptive booklet and map of Buffalo.

HOTEL LENOX
140 North St. Near Delaware
Clarence A. Miner
President

Spacious Comfort
IN CHICAGO
Auditorium hotel rooms are large, spacious and comfortable with beds that were really made for restful slumber.



WITH PRIVATE BATH FROM $2.50
WITHOUT PRIVATE BATH – $1.50

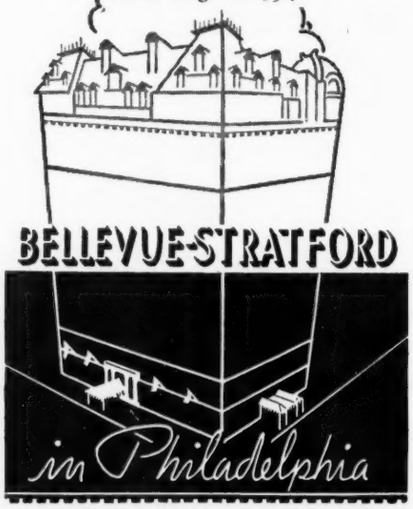
Live on Michigan Avenue, close to the Loop, when you visit Chicago. Enjoy the traditional luxury of the Auditorium Hotel–yours now at an extremely moderate cost.

Geo. H. Mink, Mgr.

AUDITORIUM Hotel
MICHIGAN AVENUE AT CONGRESS ST.

Making hospitality a very personal consideration has made the Bellevue, your home in Philadelphia, one of the World's best known hotels.

*Rates Begin at $3.50*



BELLEVUE-STRATFORD
in Philadelphia

CLAUDE H. BENNETT, General Manager

# CLASSIFIED ADVERTISING

*4 cents for each word including heading and address. Count seven words for keyed address. Minimum $1.00 for each insertion. One inch $3.00. Cash must accompany order. Copy should reach us eight days in advance of publication date. Display rates for this page will be furnished on request.*

## SITUATIONS WANTED

SITUATION WANTED—PLUMBER. Sheet Metal and Heating man wants good job. A-1 references. Will go anywhere. Address Key 329, "American Artisan," 6 North Michigan Avenue, Chicago, Illinois.

## SITUATIONS OPEN

GO IN BUSINESS FOR YOURSELF selling and installing furnaces and air conditioners. We furnish all material. You get all your money when the job is completed. Address Key 322, "American Artisan," 6 North Michigan Avenue, Chicago, Illinois.

DETROIT DISTRIBUTOR WANTED—Manufacturer of complete line of heating equipment—Air Conditioning for residences—cast iron boilers—furnaces and radiation—wants sales agency arrangement for Detroit. Will help in financing to right organization if necessary. Address Key 331, "American Artisan," 6 North Michigan Avenue, Chicago, Illinois.

## WANTED TO BUY

WANTED—62-INCH SIXTEEN GAUGE, or heavier, foot or power operated Squaring or Gap Shears. Address Key 330, "American Artisan," 6 North Michigan Avenue, Chicago Illinois.

## FOR SALE

**JOHNSON'S**
**NEW HANDY MANUAL**
**on**
**HEATING, VENTILATING**
**MECHANICAL REFRIGERATION**
**and**
**AIR CONDITIONING**

Just off the press, with 432 pages of practical, condensed information, tables, rules and diagrams.

Price $1.00—Remit with order to

**KEENEY PUBLISHING COMPANY**
**6 N. Michigan Ave., Chicago, Ill.**

## FOR SALE

**Sheet Metal Machines**
**New and *Really Rebuilt***

**A machine for every use and every machine is ready for use. The largest stock in Chicago. Ask for list.**

***Complete supplies and tools.***

**MAPLEWOOD MACHINERY CO., Inc.**
**Chicago**
**2634 W. Fullerton Ave. Brunswick 9200**
**561 W. Washington Blvd. State 1405**

FOR SALE—PLUMBING HEATING Repair and Tin Shop. Only shop in small town with large country territory. Death of owner is reason for selling. Address Mrs. Mary Ross, Francesville, Indiana.

**? ? ? ? ? ?**
**HAVE YOU A SHEET METAL PROBLEM: FORMING—BENDING—PUNCHING—SHEARING**
**WE HAVE A MACHINE FOR EACH OPERATION ON SHEET METAL**
**Your Inquiries Earnestly Solicited**
**WARD MACHINERY CO.**
**SPECIALISTS**
**MACHINES — TOOLS — SUPPLIES FOR SHEET METALS**
**562 W. Washington Boulevard**
**CHICAGO, ILLINOIS**

## FOR SALE

FOR SALE: SHEET METAL AND Plumbing Shop. Location, Alabama. Mills have run all through depression. Other interests is reason for selling. Address Key 345, "American Artisan," 6 North Michigan Avenue, Chicago, Illinois.

FOR SALE: FULLY EQUIPPED METAL and tin shop. Cement block building. Established business. Priced very low for quick sale. Other interests require owner's time. Write J. L. Isay, Churubusco, Indiana.

### Manufacturers Agents

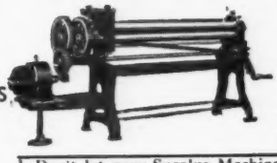
MANUFACTURERS WANTING ADditional representation often come to us for names of prospective agents now handling other lines in this field on a commission basis in a definite territory. It will pay you to be on record with us so we can refer your name to interested manufacturers. No charge or obligation, of course. It is a service we render free to manufacturers and representative. Just drop a line that you are interested in being on file and we will send you form to fill out. Address American Artisan, 6 N. Michigan Ave., Chicago, Ill.

**Patents and Trade Marks**
**Philip V. W. Peck**
**Barrister Bldg., Washington, D. C.**

**YOU CAN BENEFIT BY BUYING EFFICIENT**
**Sheet Metal Machinery at INTERSTATE**

PEXTO

APPOINTED DISTRIBUTORS
Chicago Territory
Write for
INTERSTATE-PEXTO CATALOG
Also agents for Dreis & Krump—Whitney—Beloit—Marshalltown—Dyer.



**RECENT REBUILT TRADE-INS**
Shears, Foot 30"; 36", 42", 52", 96". Brakes, Chgo. St. 8'18; 8'16; 8'14; 10'14; 10'18; 6'18; 6'16; 4'16.
30" Pexto Bar Folder.....$35.00
32" Pexto Foot Shear, all ga.$55.00
Elec. Drills B. & D. ¼"; ½"; ¾" & 1".
42" x 4" Slip Roll, 11 ga...$150.00
300 Amp. Lincoln Port. Arc Welder.

Don't let your Surplus Machinery stand idle. TRADE IT IN on Interstate Guaranteed Reconditioned Equipment. We carry America's largest stock Modern Machinery at prices that will suit your bank book. Let us quote.

"Draw On the MOST COMPLETE STOCK IN AMERICA"

NEW & USED — Send for Bulletin No. 835 listing modern requirements. ROLLS — SHEARS — BRAKES — PUNCH PRESSES BUTT, ARC & SPOT WELDERS — FOLDERS PRESS BRAKES — HAND MACHINES — STAKES — HAND & POWER

**INTERSTATE MACHINERY COMPANY**
130 S. Clinton St. . . . . Chicago
(FREE PARKING)

**"E-Z FIT" EAVES TROUGH**
*Bead is cut back, making it easy to put gutter together. Requires no soldering—not affected by expansion or contraction.*

Write for Catalogue. Order from your Jobber.

**"BB" The mark of quality**
Eaves Trough . Gutter Hangers . Conductor Pipe
Conductor Fasteners . Mitres . End Pieces and Caps
Conductor Heads . Ornamental Straps . Ventilators, etc.
**BERGER BROTHERS CO.**
229-237 Arch Street, Philadelphia, Pa.

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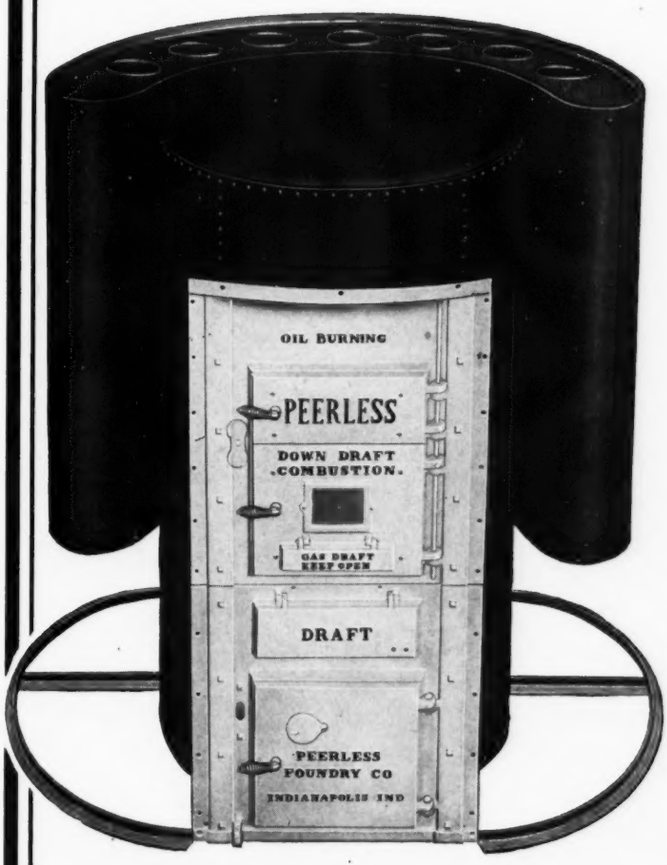
# BUILT FOR... PERFECT OIL BURNING!

## PEERLESS "A" SERIES OIL BURNING FURNACE




The Peerless "A" gives your customers a furnace that is designed . . . constructed and finished to burn oil perfectly. Its economical operation makes it possible to prove the statement "that oil heat costs no more than coal heat". Its beautiful appearance makes it a desirable addition to the finest of homes . . . its perfect construction will give years of trouble-free service . . . and of course it's a PEERLESS PRODUCT, which immediately stamps it as the most advanced on today's market.

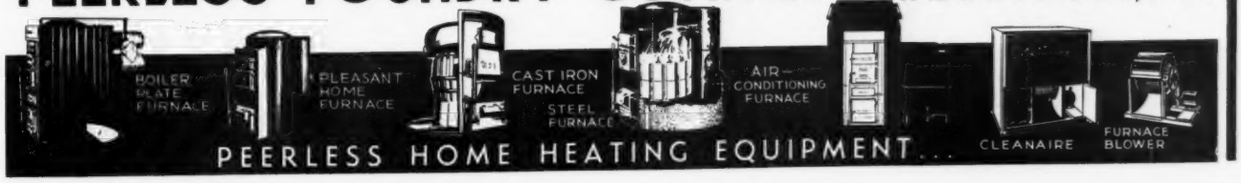
Build sales, profits and a host of satisfied customers with the Peerless Line . . . write for complete information today.

**All Peerless Products can be purchased on convenient credit terms . . . 3 years to pay.**

WE DO NOT SOLICIT MAIL ORDER HOUSES . . .

## PEERLESS FOUNDRY COMPANY

1853 LUDLOW AVE.
INDIANAPOLIS, IND.




PEERLESS HOME HEATING EQUIPMENT . . .

# ALLEGHENY METAL

## THE TIME-TESTED STAINLESS STEEL

ENTRANCES

PORTABLE BARS

KITCHEN EQUIPMENT

STOVE PIPE

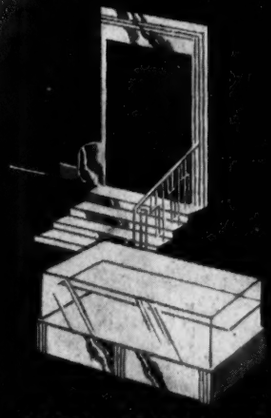
*Used successfully for more than Nine years!*

VENTILATORS

DUCTS

Allegheny METAL CONTROLS CORROSION — THE SAFE METAL

WINDOW DISPLAYS



STORE EQUIPMENT

JUST A FEW OF THE HUNDREDS OF PRACTICAL APPLICATIONS FOR ALLEGHENY STAINLESS STEELS

Ventilators
Kitchen Sinks
Grills
Ventilating Ducts
Window Displays
Metal Ornamentation
Smoke Pipe
Pilasters
Railings
Entrances
Exhaust Systems
Store Fronts & Fixtures
Vats, Tanks of All Kinds,
Etc., Etc.

Plain piece of stove pipe or palatial store front, kitchen sink or gleaming building dome—it can be made *better* with ALLEGHENY METAL . . . that silvery-bright metal of permanent beauty and lustre.

Unrusting, unstaining, untarnishing, this time-tested stainless steel gives sheet metal manufacturers the IDEAL material . . . ductile, easy working, strong—capable of unlimited uses and applications. Check up on its profitable possibilities in *your* plant. Write for our new Bulletin "As the World Sees Allegheny Metal".

## ALLEGHENY STEEL COMPANY

**BRACKENRIDGE, PA.**

Sales Offices and Warehouse Stocks in the Principal Cities. Stocks carried by JOS. T. RYERSON & SON, INC. WAREHOUSES

Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia and Jersey City . . . Union Hardware & Metal Co., Los Angeles . . . American Brass and Copper Company, San Francisco-Oakland

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